COAL AGE

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The Coal Miner

By Berton Braley

Written Expressly for Coal Age.

I

The engineer lays out the mine
An' tells just where the workin's goes,
An' when it comes to rule an' line
I guess he knows, I guess he knows,
The super'ntendent runs it all,
He's boss of every part an' whole,
But just the same I gets the call,
For I'm the guy who digs the coal!

II

The breaker boys, they does their share,
The pumpman does his duty, too,
An' then there's them that gives us air
An' hoists us up when we are through,
An' them that hauls the coal away,
An' them that keeps the workin' roll,
But don't forget ME, partner, say,
For I'm the guy who digs the coal!

III

It's me that drills where roofs is low,
Often lyin' on my side,
Until my body's achin' so
That nothin' keeps me there but pride,
It's me that takes the chance of damp
Or pickin' in a loaded hole,
It's me that wears the miner's lamp,
For I'm the guy who digs the coal!

IV

It's coal that makes the engines run,
It's coal that drives the ships at sea,
That gets the great world's labor done
An' warms the homes of you an' me,
It's coal that gives the strength to steam
An' I'm the grimy human mole,
That brings it out of vein an' seam,
Yes, I'm the guy that digs the coal!

V

They pats me on my sweatin' back
An' tells me I'm a high-class guy,
Although my face with dirt is black
An' I got coal dust in my eye,
But though they smile an' grin an' smirk
An' tell me I'm a "noble soul,"
I know my job is damn hard work,
For I'm the guy who digs the coal!

Trade Unions and the Law

By Henry R. Seager

SYNOPSIS—The suggestion is made that regulation of combinations is far better than prohibition of such bodies. An anti-combination law against wage earners would be unjust.

An incident of the present Colorado strike—the indictment of officials of the United Mine Workers by a Federal Grand Jury in Pueblo—again brings to the fore the relation of unions to the Sherman anti-trust law.

No single action of President Wilson has called forth more criticism than his approval, last June, of the sundry civic bill. This provided, among other things, that no part of the $300,000 appropriated for the enforcement of the anti-trust law should be used for the prosecution of labor organizations.

That such a method of limiting the activities of the Department of Justice was highly objectionable, few will deny. It does not appear, however, that the President was responsible either for the inception or for the execution of the plan. To avoid the necessity of changing—perhaps with serious consequences—a carefully prepared legislative program, he signed the bill in the exact form in which it had been passed by the previous Congress. He took pains, however, to qualify his approval by declaring that if it were possible for him to veto the "proviso," without vetoing the whole measure, he should unhesitatingly do so. Also, he pointed out that other funds at the disposal of the government made the limitation as regards this particular appropriation of no practical importance.

More important than the proper apportionment of praise and blame between the President and Congress for the legislation criticized, is the question whether the exemption of labor organizations from the operation of the anti-trust act is itself justifiable or desirable. Congress seems clearly disposed to accord such exemption. In the daily press the only intelligible reason given for this determination is the growing influence of the labor vote. If this were in truth the only motive behind the proposed policy, Colonel Harvey's declaration that the country seems destined soon to "face a determined struggle for class domination whose outcome every patriotic citizen must contemplate with the gravest foreboding" would seem fully warranted. But are there not better reasons for excepting labor organizations from the condemnation of the Sherman law than the fact that labor leaders in and out of Congress desire it?

Sherman Law Should Not Be Applied to All Combinations in Restraint of Trade

That the anti-trust act should not be applied indiscriminately to all combinations in restraint of trade is now generally agreed. After a good deal of hesitation, the Supreme Court of the United States has itself come to that conclusion, although it has not yet clearly indicated what the basis of discrimination, beyond the vague "rule of reason," is to be. Combinations of producers, using unfair methods to build up monopolies and then using their monopoly powers to extort unreasonably high profits from scattered and unorganized consumers, must certainly continue to fall under the condemnation of the law. From this class of clearly obnoxious and unlawful combinations there is a gradual gradation of combinations, like those of Western fruit growers attempting to maintain fair prices for their products in Eastern markets, which all would approve.

Shall we wait for the Supreme Court to work out a satisfactory classification of combinations, condemning the objectionable and upholding the "reasonable" or are there certain principles of condemnation which Congress may itself advantageously apply? I believe that there is one such principle that may at once be applied and that justifies the proposal to accord special treatment to labor organizations—a principle that has been embodied in English law since 1875 and that seems to have operated there in a way that has given general satisfaction.

Amid the complexities of the combination movement two distinct sets of economic relations are clearly separable. One concerns the dealing between the producers and consumers, or the sellers and buyers, of commodities; the other the dealings between employers and employees. Referring to the latter the British Conspiracy and Protection of Property Act of 1875 declared that in connection with trade disputes no agreement or combination to do, or to procure to be done, any act "shall be indictable as a conspiracy if such act committed by one person would not be punishable as a crime." In other words, combinations of wage-earners or of employers concerned with the questions of wages, hours, etc. that arise between them were expressly relieved from the condemnation which the common law applied to "combinations in restraint of trade."

British View Was That Combination Was Beneficial

It was believed that in this field combination instead of being an evil was on the whole beneficial. Wage-earners should be encouraged to combine—"trade union acts" were passed by the same Parliament—since combination was necessary to the protection of their interests. By combining on their side, employers could easily protect themselves from excessive demands on the part of the labor combinations. They should be allowed to combine with equal freedom. The interest of the public would, it was thought, be sufficiently safe-guarded if individuals were held to strict responsibility for their individual acts, the added penalties applying to conspiracies becoming operative only when the acts committed by combinations were in themselves criminal.

This cannot fairly be characterized as class legislation. The exemption applies as well to combinations of employers in connection with trade disputes as to combinations of employees. It is merely a recognition of the fact that the relations between employers and employees present one phase of the combination movement; the relations between producers and consumers, sellers and buyers, a different phase.

The proposal to exempt labor organizations from the operation of the anti-trust act is an application of this same principle. In its practical operation the anti-trust

Note—From "The Survey," Jan. 10, 1914.

act has frequently been applied to labor organizations; never, so far as I am aware, to employers' associations. Because it has never been turned against employers' associations, it has been assumed, perhaps too hastily, that they do not now come under the law. Those who advocate the exemption of labor organizations may easily clear their proposal of the charge of involving class legislation by following the example of the British parliament and causing the exemption to apply alike to employers' associations and labor organizations in respect to their mutual relations. This is what is really aimed at. The exclusion of employers' associations, which has been tacitly assumed, should be expressly added if labor organizations are to be excluded.

There are several arguments that may be urged in favor of this change. The anti-trust law has been held to prohibit the use of the boycott. There seems no reason, so far as the argument runs, why it should not also be held to prohibit the strike. Strikes certainly present combinations engaged in restraining trade as clearly as boycotts. But such an extension would bring our federal law back to the stage of development in which state laws were in the first quarter of the last century. Strikes and boycotts are to be deplored, no doubt; but does not the path of progress lie through developing combinations on both sides and arrangements for collective bargaining, conciliation and arbitration, that will make a resort to these weapons unnecessary? This is the well-nigh unanimous view of economists.

Capitalistic Combinations and Labor Organizations Are Quite Different

The normal procedure under the anti-trust act is a dissolution suit carried on at the instance of the government. Does anyone seriously advocate the dissolution, through judicial order, of our larger labor organizations? The American Federation of Labor has often been the target of attack for embittered employers, but, so far as I know, no one has gone so far as to petition the government to dissolve it, and for obvious reasons. This fact alone shows how different is the problem presented by the great capitalistic combinations and by labor organizations. The remedy that is applied as a matter of course to the one is not even thought of in connection with the other.

Finally, there is good ground for urging that the present law operates unfairly. The fact that it has not yet been invoked against a single employers' association, though frequently applied to labor organizations, is indirect evidence of this. Without any special machinery or publicity employers may readily come together, with business management concentrated as it now is, to agree on common policies with reference to employees. The political activities of the National Association of Manufacturers, revealed through the recent congressional inquiry, shows how far such associations may sometimes go without arousing suspicion of their purposes or methods. Thus effective combinations in restraint of trade may be maintained on the employers' side without attracting attention or giving rise to evidence that might later be utilized in legal actions.

The same is not true of wage-earners. Combined action for them means coming together in public meetings, publishing information in labor papers that may be widely read; in short, advertising as widely as possible what they propose to do and the means they propose to use in doing it. It is easy to prove the existence of the combination, if it amounts to anything. The consequence is that an anti-combination law may be enforced with little effort against wage-earners, scarcely at all against their employers. Feeling the injustice of this situation and their helplessness, the more hot-headed and ill-balanced among wage-earners are only too apt to turn to secret and lawless methods that are socially much more deplorable than any number of strikes and boycotts conducted openly and with proper regard for the public peace.

In this situation, not prohibition of combinations in connection with trade disputes, but regulation applied impartially to both sides by competent administrative officers would seem to be what is needed. If this should prove a first step toward the substitution of regulation for indiscriminate prohibition for combinations of all sorts, so much the better.

Progress of Coal Briquetting

By R. Schorr*

The increase in the world's coal output since 1900 amounts to over 62.4 per cent., which has been due mainly to the United States and to Germany, while the gain of Great Britain is but 14 per cent.

The production of coal briquettes has risen from 4¾ million tons in 1885 to 33 million tons in 1913 (36,366,000 sh. tons), equal to an increase of about 595 per cent. The rapid growth of the German lignite- (brown coal) briquetting industry has been mainly responsible for this, having furnished in 1912 over 19,050,000 metric tons. The total production of Germany in that year was 25.7 million metric or about 28.3 million short tons, equal to almost 78 per cent. of the world's output.

Belgium, France and England combined, manufactured 5.5 million metric tons, leaving for the balance of the world approximately 1.8 million metric tons.

Incomplete returns for 1913 indicate that the "official" briquette production of the German empire will be over 26.7 million metric tons, and allowing, conservatively, 1.3 million tons for the unlisted plants, which are operated by coal dealers, a total of 28 million metric tons (30,856,000 short tons) can be safely expected. England and France will also show gains, so that the briquette output of the world will probably reach 35.5 million metric tons, or 39,120,000 short tons in 1913.

There are about 600 briquetting plants in the world, employing close to 600 presses on bituminous coal and anthracite, and between 1400 and 1500 presses on lignite. Over 80 per cent. of the installations are in Germany.

The history of briquetting in the United States forms a marked contrast with the development of most of our other industries. Over 40 plants have been built, but less than half of this number is still in existence. The reported output was 218,443 short tons in 1911, and 230,064 short tons = 199,597 metric tons in 1912. There will be, however, a very material increase in 1913, due to the new plant at Berwind.

*San Francisco, Calif.

Underground Concrete Protective Work in Illinois Mines

By G. E. Lyman*

SYNOPSIS—Detailed description of an unusually elaborate undertaking in mine concreting on the part of the Madison Coal Corporation. Steel I-beams, reinforced concrete and concrete blocks were used according to varying conditions and loads. The application of concrete to underground conditions has not become sufficiently general yet to evolve the customary rules and formulas. The work here described is of particular interest in view of the fact it has stood the test of time.

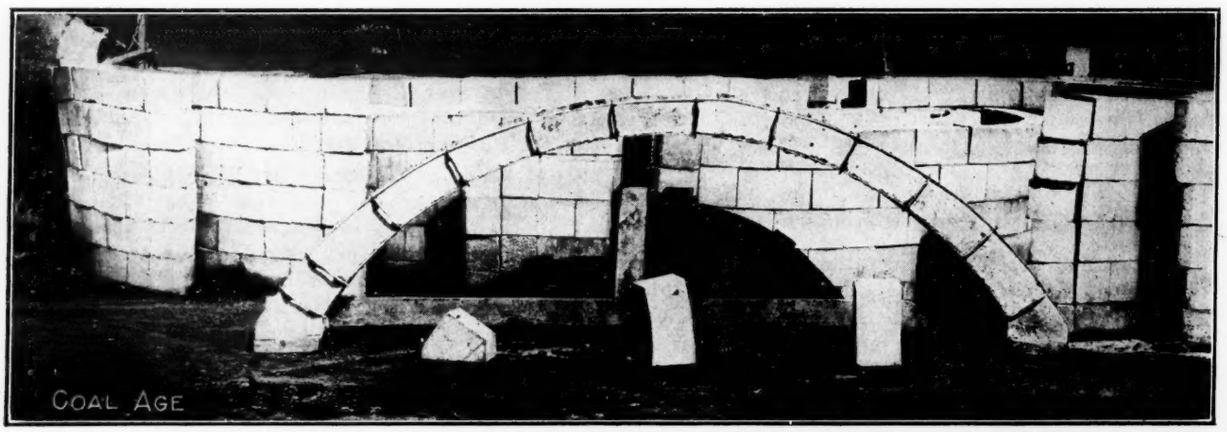
Some few years ago the Madison Coal Corporation came in possession of the mine at present known as its No. 9 operation, its acquisition being incidental to an extensive coal land deal in Williamson and Franklin Counties, Ill. The property had been opened up by a local company whose limited capital, and mistaken ideas of economy, prevented their incurring the small additional expense necessary to obtain competent engineering supervision at that critical stage of development. The result was that the shaft pillars were robbed to such an extent, and so many openings made immediately around the bottom, that most energetic measures on the part of the new owners were required to save it.

The mine operates in the No. 6 seam, according to the Illinois Geological Survey's most recent nomenclature. The coal has an average thickness of 9 ft., the upper 18 in. of which is ordinarily left in during mining for roof protection; it is recovered as each working place is finished. Above is a shale and soft limestone roof, which disintegrates rapidly on exposure to the air and above this is the clay and soil, the total depth of cover being about 110 ft. Below the coal is from 6 to 18 in. of fireclay, resting on limestone. The presence of this limestone bottom so near the base of the coal, alone made it possible for the present owners to save the property from the destruction which would otherwise inevitably have followed as the result of the methods used in the original development.

*Mining engineer, the Madison Coal Corporation, Glen Carbon, Ill.

The Inadequate Pillars

As will be noted on the accompanying illustration the pillars between the main bottom and the north run-around range from 10 to 17 ft. in thickness. About 60 ft. east of the hoisting shaft on each side of the run-off for the empties, these pillars feathered out to narrow points, and were beginning to take weight so rapidly that the crushing of the coal could be readily observed. At the narrow edges of the pillars immediately north of and adjoining the hoisting shaft, the same crushing commenced, and the roof fell to such a height immediately adjoining the shaft as to endanger the timbering. Crushing of the coal also occurred near the pump room, where considerable gouging of the pillar had been done in an apparently aimless attempt to connect the two shafts below.



Iron Form for Blocks of Concrete Arch. Finished Blocks in the Background

Both run-arounds, where the empty trips are made up, had been depressed to give gravity operation for the empties, and the clay thus exposed to the air had crumbled away rapidly, leaving the face of the rib unsupported. In consequence of this, serious rashing of the coal occurred, although normally this coal will stand any length of time, and carry any weight below its crushing load without signs of rashing. I have observed workings abandoned twenty years in this field, where the pick marks of the original entry driving were plainly visible. The result of this serious rashing had been to widen the openings, allow the top coal to break, and by exposing the roof to the action of the air, had caused destructive and dangerous falls.

It will be apparent from foregoing that there were three distinct conditions to be provided for, each with its own individual remedy, as follows:

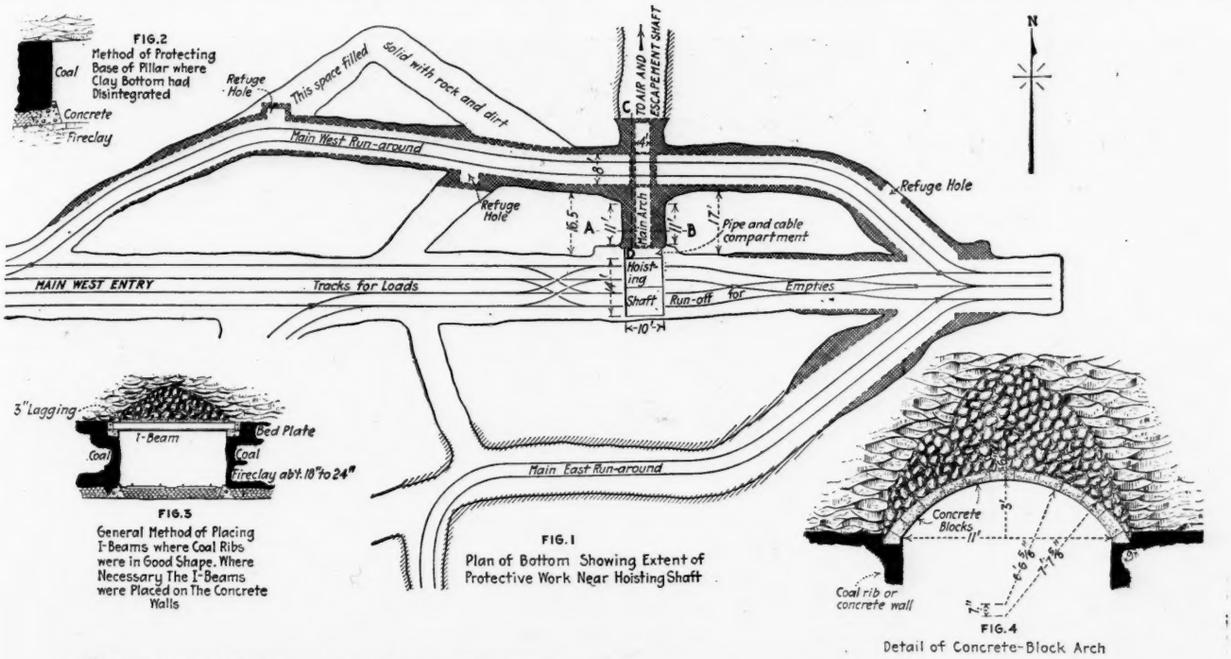
First—Protection of the base of the ribs where the fireclay had been eaten out from beneath.

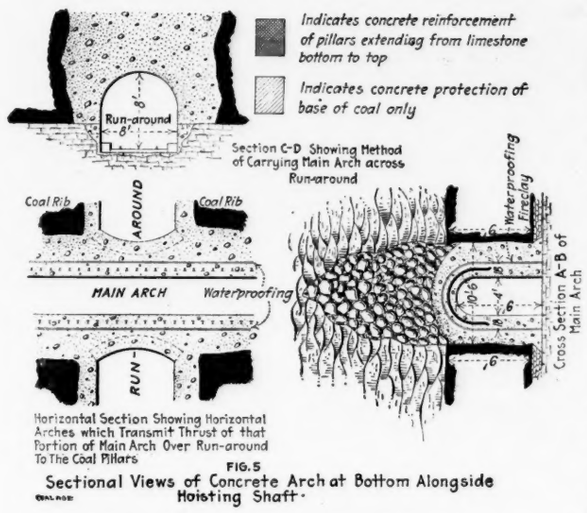
Second—Protection of the roof at high falls.

Third—Most difficult and important of all, the reinforcement and strengthening of the pillars where the coal had commenced to crush through excessive roof pressure.

The first item was a comparatively simple matter to handle, and was effected in the manner indicated in the accompanying drawing. The loose and decomposed clay was removed, the excavation carried down to rock, and concrete placed as shown in the sketch, being carried up over the base of coal about one foot, and given a crown of 8 in., with a batter of one in four. The further disintegration of the fireclay thus being effectively stopped, and that already lost being replaced with a material creosoted oak lagging, and the space between the lagging and roof filled with rock and clay, tamped tight. Experience has demonstrated that by thus shutting the air off the roof, there is little likelihood of further falling, and an excessive weight seldom comes on the beams. In cases where the rib was shattered, or out of line, concrete walls resting on the rock were resorted to. Fig. 3 illustrates the general construction employed.

The exact computation of the load eventually coming




Indicates concrete reinforcement of pillars extending from limestone bottom to top
Indicates concrete protection of base of coal only
Run-around
Section C-D Showing Method of Carrying Main Arch across Run-around
Coal Rib
AROUND
Coal Rib
MAIN ARCH
Waterproofing
RUN
Waterproofing
Fireclay
Cross Section A-B of Main Arch
Horizontal Section Showing Horizontal Arches which Transmit Thrust of that Portion of Main Arch Over Run-around To The Coal Pillars
FIG.5
Sectional Views of Concrete Arch at Bottom Alongside Hoisting Shaft.

Details of Construction Used

strong enough to carry the weight, no further trouble from that source was experienced.

Steel I-Beam Roof Supports

The second item, roof protection, was handled in ordinary instances by using steel I-beams, of size and weight varying with the span, spacing them on 3-ft. centers. Where the ribs were in good shape the beams were mounted in hitches, which were then filled with concrete, giving them a solid bearing and effectually preventing them from turning. The beams were covered with 3-in.

on beams under such conditions is manifestly an impossibility. It was decided to use beams which possess about a third more strength than that of an oak timber of the size which experience under similar conditions would lead to be selected for the same service. This strength of beam was figured as being based on the standard section, and in placing the order for the steel, beams of the same depth, but with a somewhat heavier web, were specified. The employment of this extra metal in the web (the critical part for this service) has the practical result of increasing the factor of safety and providing to some extent for unforeseen overloads, and the extra cost may be regarded as insurance against undue weakening through corrosion, a certain amount of which cannot be avoided during a long-lived mine, despite regular painting.

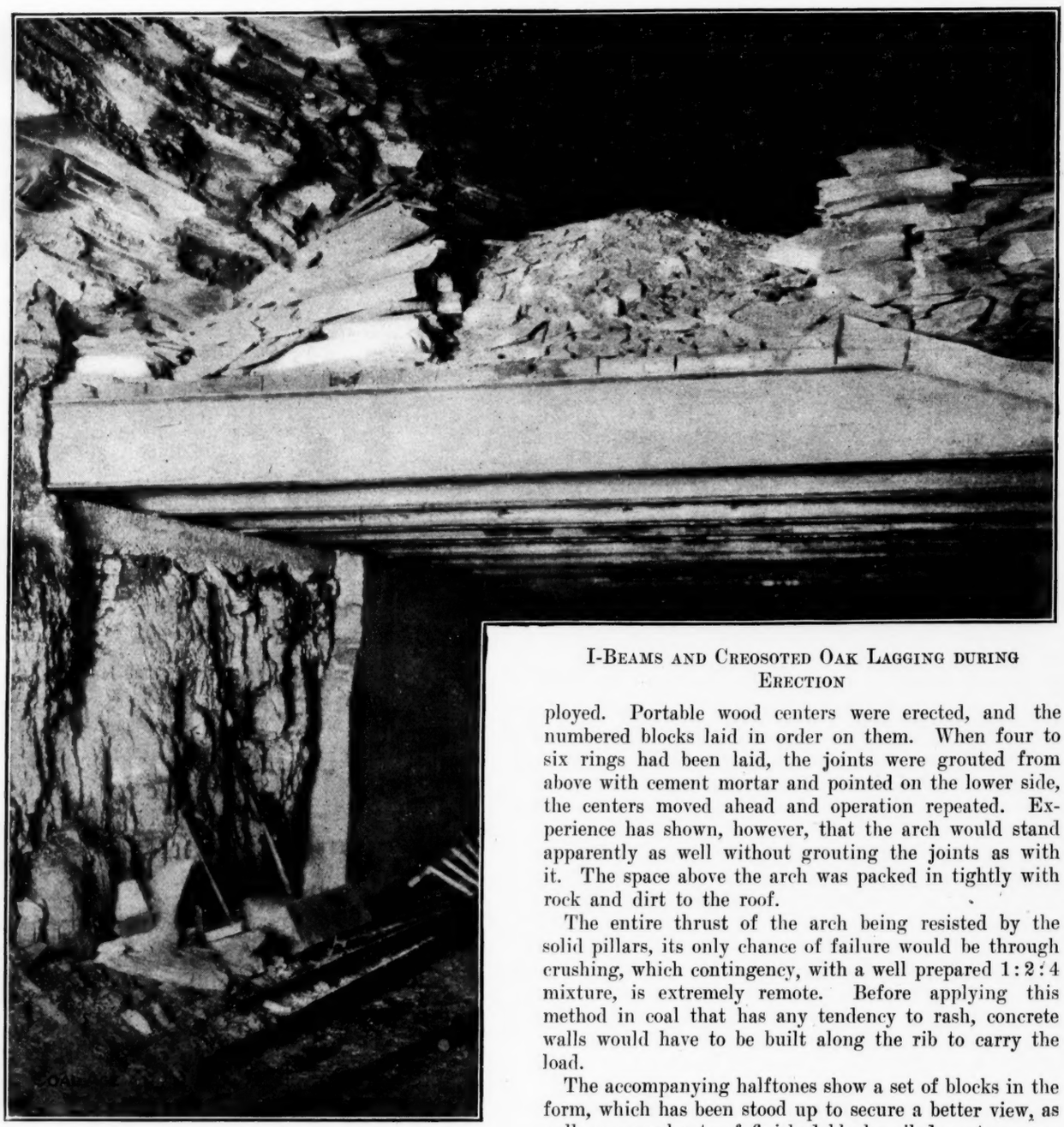
Where necessary to cross openings, such as other haulage ways, girders made of two or more heavy I-beams bolted together were employed. These girders were calculated for a strength sufficient to allow of doubling the number of I-beams carrying the roof, if ever such an emergency should arise, without exceeding the safe load on the girders.

Concrete Blocks

The entire empty side of the shaft bottom was treated in this manner, as well as the passage way between the two shafts, and a considerable portion of both run-a-rounds. No trouble has been experienced with any of this work, and it gives every indication of having permanently remedied conditions.

The roof of the west split for a distance of 200 ft.

from the bottom of the air shaft had fallen so high, and conditions indicated the probability of such an excessive load coming on whatever protection might be installed, that it was decided to use a concrete-block arch. Fig. 4 shows the dimensions of the arch and its individual blocks, and the manner of placing same in the entry. Forms were made of iron, accurately shaped according to plan, and the blocks made on the surface, where they were allowed to set thoroughly before taking below. A



I-Beams and Creosoted Oak Lagging during Erection

concrete consisting of one part portland cement, two parts sand, and four parts limestone, crushed to from ¼-in. to ¾-in. size, was used. The partitions in the form were so arranged as to allow of breaking joints as the successive rings of the arch were put in place below. As the blocks came from the forms, those in each set were numbered, so they might be erected again in the same order. Inasmuch as the perfection of the arch depends so greatly on the nicety of finish of the radial joints, great care was taken to have the planes leave the forms with a true and smooth surface.

The erection below was comparatively simple, though at times surrounding conditions made the work difficult, as well as dangerous. Where possible, continuous hitches were cut in the solid rib for the abutment blocks, and where necessary, concrete walls and foundations were employed. Portable wood centers were erected, and the numbered blocks laid in order on them. When four to six rings had been laid, the joints were grouted from above with cement mortar and pointed on the lower side, the centers moved ahead and operation repeated. Experience has shown, however, that the arch would stand apparently as well without grouting the joints as with it. The space above the arch was packed in tightly with rock and dirt to the roof.

The entire thrust of the arch being resisted by the solid pillars, its only chance of failure would be through crushing, which contingency, with a well prepared 1:2:4 mixture, is extremely remote. Before applying this method in coal that has any tendency to rash, concrete walls would have to be built along the rib to carry the load.

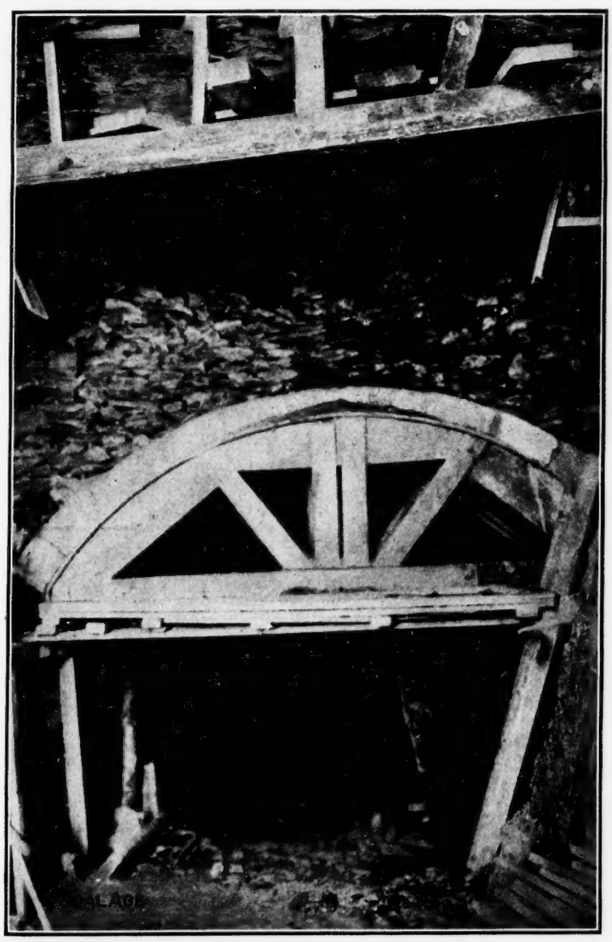
The accompanying halftones show a set of blocks in the form, which has been stood up to secure a better view, as well as several sets of finished blocks piled up to season before taking below. Another view shows the method of placing the blocks on the portable wood centers, and the method of filling in above, while a third shows a section of the finished work*.

*Some of these photos have already been published in previous articles (see "Coal Age," Vol. 4, pp. 619 and 640) on the Madison Corporation and also in "snap shots" (see Vol. 4, p. 813) and so have been omitted here.—Editor.

Renewing Pillars and Miscellaneous Details

The third item, strengthening the pillars where the coal had commenced to crush and break, was handled by filling in with solid concrete wherever possible. Concrete walls were run along the ribs, ranging in thickness from 18 in. to as much as 6 ft. in some extreme cases. The shaded portions of the bottom plat, Fig. 1, indicate the extent of this work, and will give a fair idea of the general conditions which had necessitated such an amount of this protection. One, two and four concrete, on account of its great crushing strength, was used in all this work. It was placed on the limestone bottom, and carried to the roof, at the same time furnishing support for the I-beams.

The especially bad place immediately north of the



Concrete Block Arch and Portable Wood Centers

hoisting shaft presented unusual difficulties, as it could not be filled in solid on account of being an indispensable passage way, while crossing it at right angles was the north run-around. It was decided to use here a solid concrete arch, of massive proportions, sufficient in strength to carry the dead weight of the entire strata above, if necessary; at this particular place the weight of cover over the coal is estimated at approximately six tons per square foot.

In Fig. 5 are sections of this piece of work, which really consists of three separate and distinct arch-elements. The main arch, with a clear passage way of 4 ft., begins at the north edge of the shaft, and extends across the run-around, and about 10 ft. on the other side to a firm anchorage in the pillar. Two secondary arches, with a span of 8 ft., carry the main arch across the run-around, while a third set of arches, placed horizontally, carry back to the solid pillar, the thrust of that portion of the main arch over the run-around.

Considerable water being present, and the space for working extremely limited, the main arch was built in two operations. The inner shell, 18 in. thick, was placed first, and then thoroughly coated with pitch; then came a layer of 2-ply Black Diamond roofing, made by the Barrett Mfg. Co., and a second coat of pitch. Another layer of roofing and a third coat of pitch were applied, and the remaining portion of the concrete laid, filling in solid to the ribs. Above, the arch was filled in to the roof.

The reinforcement consisted of 35-lb. rails, bent to shape and placed on 1-ft. centers as shown in vertical section, and rods were used lengthwise. The photographic view gives a fair idea of the appearance of the finished work, and painly shows the arches over the run-around carrying the main arch over this space. The work has been in place over three years now, and stands today without a visible flaw. Although built in a very wet place, no sign of seepage has appeared. No further trouble has been experienced with the timbering of the hoisting shaft, and apparently the built-up ground alongside the shaft is as good as the original strata.

The work herein briefly described has resulted in saving the entire bottom development, and in adapting it fairly well to the requirements of a high-tonnage mine. Needless to say, it forms a conspicuous example of the expense and trouble often incurred, when opening a mine, through lack of carefully prepared plans and competent supervision in carrying them out.

Last Year's Anthracite Shipments

Final figures for 1913 show that the total shipments of anthracite coal from Pennsylvania last year were 69,069,628 tons. This is 5,459,050 tons more than in 1912, when the output was curtailed by a suspension in the spring, while a new agreement was being negotiated with the mine workers; but 884,669 tons less than in 1911, which was the record year for high production.

Total shipments of anthracite last month were 5,662,618 tons, as against 5,944,502 tons in December, 1912, a decrease of 281,884 tons. The amount of coal, on hand at tidewater shipping ports, decreased slightly, from 603,031 tons on Nov. 30, to 602,328 tons on Dec. 31.

The Lehigh Valley R.R. led in tonnage last month with 1,062,578 tons; the Philadelphia & Reading Ry. was second, with 1,058,723 tons; the Lackawanna was third with 839,384 tons; the Erie carried 709,431 tons; the Central Railroad of New Jersey, 663,395 tons; the Delaware & Hudson, 590,158 tons; the Pennsylvania, 546,976 tons; and the New York, Ontario & Western, 191,973 tons.

The examination of a mine to detect the presence of gas should be made by a competept man carrying only an approved safety lamp, within three hours of the time when the men enter the mine. Every working place should be visited and some mark left to indicate that the place has been examined. The condition of each working place should be noted in a special book which should be accessible to every underground employee.

Pennsylvania Bituminous Operators Hold Stormy Session

The Association of Bituminous Coal Operators of Central Pennsylvania held its regular Annual Meeting in the Betz Building, Philadelphia, Penn., Jan. 8. Almost the entire membership was in attendance. The tonnage represented amounted to approximately 70,000,000 tons per annum.

The meeting was not entirely harmonious, owing to the fact that there was a strong disposition on the part of a number of members to dissolve the Association for the reason that the United Mine Workers of America, District No. 2, allowed their members to violate the present scale agreement grossly, the argument being that it was useless to make a contract with a labor organization which willfully violated its contract at its convenience and which had apparently no officials connected with it who had power to enforce the terms of the contract.

Union Fails to Answer Association

This situation was considerably aggravated when the executive committee reported to the meeting that on Dec. 12, 1913, at a meeting held in Philadelphia, a communication was prepared and submitted to Patrick Gilday, President of District No. 2, United Mine Workers of America, calling attention to the numerous violations of the contract on the part of the miners and that the dissolution of the Association was seriously threatened by continuation of such conduct and that up to date no reply had been received by the Association other than a mere acknowledgment of the communication.

At the time the letter was addressed to President Gilday, closed-shop strikes were being enforced in the district, some of which not only still exist, but are being supported by the United Mine Workers of America, who furnish the striking miners with relief funds. The effort to smooth out the difficulty caused a motion to be made to refer the matter of dissolution to the executive board of the Association. This motion was defeated.

It was then suggested that under a recent decision of the United States courts labor organizations, such as the United Mine Workers of America, both as an organization and individually, could be held liable in damages resulting to the operators from these violations and particularly from the closing down of the mines to enforce the closed shop, which was prohibited by the terms of the contract.

One Hundred Strikes in Central Pennsylvania

It was reported to the Association that approximately one hundred strikes have occurred during the life of the contract, in violation thereof, a substantial number of which were called almost entirely to enforce the closed shop. It was only when the Association agreed to the appointment of a committee for the purpose of listing all the strikes that occurred in violation of the contract and ascertaining from each individual operator the damage suffered by reason thereof and to make report within 30 days of the result of such investigation, together with such recommendation as the committee deemed proper towards instituting actions for the recovery of damages, that the members of the Association agreed to submit the question to the executive board. This was considered quite a victory for the members who advocated the continuance of the Association, but when it came up to the executive board to take action, everybody was much surprised as a close vote resulted, seven voting against, and six for dissolution.

The meeting was in session from 10:30 a.m. until six o'clock p.m., excluding an hour's adjournment for lunch. The officers elected for the ensuing year are as follows:

President, B. M. Clark, Rochester & Pittsburg Coal & Iron Co.
Vice-president, C. H. Rowland, President Moshannon Coal Mining Co., Inc.
Secretary and Treasurer, W. R. Roberts.

Executive Committee

L. W. Robinson....	Pres. & Gen'l Mgr., The Rochester & Pittsburg Coal & Iron Co.....	Punxsutawney, Penn.
Rembrandt Peale...	Pres., Peale, Peacock & Kerr, Inc...	New York, N. Y.
R. A. Hatfield.....	Messrs. Hatfield & Hilles.....	Philadelphia, Penn.
C. H. Rowland	Pres., Moshannon Coal Mining Co.	Osceola Mills, Penn.
W. A. May.....	Gen'l Mgr., Northwestern Mining & Exchange Co.....	Scranton, Penn.
John Langdon.....	.....	Huntington, Penn.
Arthur M. Riddell..	David E. Williams & Co.....	Altoona, Penn.
F. A. Hill.....	Res. Mgr., Madeira, Hill & Co., Inc.	Pottsville, Penn.
J. B. Irish.....	Irish Brothers.....	Philadelphia, Penn.
H. B. Douglas.....	Vice-Pres., & Gen'l Mgr., Clearfield Bituminous Coal Corporation...	Clearfield, Penn.
W. R. Craig.....	Chief Engr. & Act. Gen'l Supt., Shawmut Mining Co.....	St. Marys, Penn.
F. H. Wigton.....	Pres., Morrisdale Coal Co.....	Philadelphia, Penn.
I. A. Boucher.....	Gen'l Mgr., Logan Coal Co.....	Beaverdale, Penn.
J. R. Caseley.....	Buffalo & Susquehanna Coal & Coke Co.....	Du Bois, Penn.
H. A. Tompkins....	Pres., Portage Coal Mining Co....	Portage, Penn

Committee on Coal and Coke

Under authority of the Board of Directors of the American Institute of Mining Engineers, President Rand has appointed a "Committee on Coal and Coke," to have charge of this branch of the Institute's activities. One of the main objects of the committee will be to secure for the Institute good papers on coal-mining subjects.

The committee is composed as follows:

H. M. Chance, Chairman, S. A. Taylor, Vice-Chairman,
S. D. Warriner, Vice-Chairman, F. W. C. Whyte, Vice-Chairman,
H. S. Fleming, Secretary, 1 Broadway, New York

Franklin Bache	Howard Eavenson	Floyd W. Parsons,
A. W. Belden,	Frank Haas,	Edward W. Parker,
S. W. Beyer,	F. A. Hill,	Edgar P. Pettebone,
William H. Blauvelt,	Charles F. Huber,	Erskine Ramsay
F. M. Chase	A. B. Jessup,	George S. Rice,
Clarence R. Claghorn,	Edwin Ludlow,	W. J. Richards,
E. H. Coxe,	W. J. Murray	Carl Scholz,
F. W. DeWolf,	R. Van A. Norris,	H. H. Stoek,
Charles Enzian,	T. H. O'Brien,	Morris Williams.
George W. Evans,	W. N. Page,	

Hailwood Lamp Approved by Belgian Government

The Belgian government has this week signed the authorization approving of the use in Belgium of the Hailwood oil lamp, and also the Hailwood naphtha lamp, as manufactured by Ackroyd & Best, Ltd., of Pittsburgh, Penn.

The Belgian government tests are far more severe than those of many other governments, natural gas from the Grand Trait mines being employed in the gas tests. The lamp is subjected to the most explosive mixtures of this gas and air traveling at velocities of 5, 7, 9, 11 and 15 m. per sec.; the limiting velocities expressed in feet being 984 and 2590 ft. per min., respectively. The whole series of tests are repeated in horizontal currents, downwardly descending currents at an angle of 45 deg., upwardly ascending currents at an angle of 45 deg., vertical descending currents and vertical ascending currents so as to assure the safety of the lamp under all conditions, no matter how adverse.

Mine Drainage by Compressed Air

By A. D. Spears*

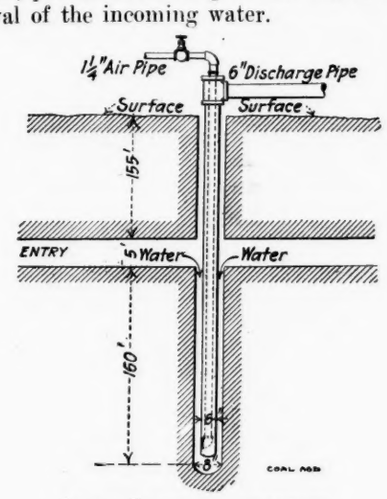
SYNOPSIS—When water broke into the mine from a "cave-in," it was removed by putting a bore hole down through a local dip in an entry and installing an air lift.

In December, 1912, water broke into the Crown Hill No. 1 mines, owned by the Clinton Coal Co., of Clinton, Ind. This was caused through the caving of an old room.

This mine is working the Indiana No. 5 bed of coal, which in this locality is about 160 ft. from the surface. This coalbed is generally dry, and in the mine in question the only pump installed was that for the sump at the bottom of the shaft. The bed has, however, several local dips, and fortunately the main west entry of the mine

The Air Lift Discharging Mine Water at the Surface

starts in one of these. Since mines Nos. 1 and 2 are connected and Mine No. 3 is sunk to the No. 3 bed of coal, which is the one below that being worked by Nos. 1 and 2 mine, permanent arrangements had to be made for the removal of the incoming water.



Cross-Section through Mine and Air Lift

As pumps and pipe had to be ordered, the water soon caused the abandonment of the west part of the mine. It was the consensus of opinion, however, that the influx of water would soon stop, and only a 3-in. pipe line was laid for its removal, this extending for a distance of about 4000 ft. The 3-in. line proved inadequate to handle the water, and second and third 3-in. lines were subsequently laid. Rough measurements showed that the water was coming in at the rate of about 700 gal. per minute.

It was then decided to put down a drill hole, and discharge the water direct to the surface, and the air lift, as used in many city water plants, was suggested for this purpose.

A survey was made for the drill hole, as it was necessary that this should go through an entry, in order that the water might gain access to the hole. This drill hole was completed the latter part of January, 1913, and water was pumped continually 24 hours a day for four months. From the first day the air lift was started, the water was gradually lowered, but after about six weeks it was deemed advisable to put down another drill hole and install a second lift. The driller, however, had bad luck, and it took some time to finish the hole, and the water was pumped out before the job was completed. It is still necessary, however, to run one air lift 8 hours out of 24 in order to keep the water down.

The accompanying drawing illustrates this method of water removal. The system is most generally used in artesian or driven wells for raising either fresh or mineral waters from any depth. The only equipment necessary is two pipes in the hole and an air compressor. For the best results, somewhat over 50 per cent. submergence of the discharge pipe is required, but fairly good work can be done with only a 40 per cent. submersion.

*Clinton, Ind.

Recent Legal Decisions

Right to Rescind Purchase of Coal in Place—A purchase of all the coal in place in a tract of land cannot be rescinded on account of the coal area being smaller than was expected, if the land contains a substantial quantity. Nor may the purchaser rescind because of the non-existence of a particular bed. "In all cases of sale by the acre, there may be an abatement from the purchase price for deficiency in quantity * * * * Right to abatement or compensation for a deficiency in the case of a sale of land in gross stands upon the existence of a warranty of quantity or fraud and misrepresentation on the part of the vendor, respecting the quantity." (West Virginia Supreme Court of Appeals, Light vs. E. M. Grant & Co., 9 Southeastern Reporter 1011.)

Mining under 999-Year Lease as Invasion of Landowner's Rights—Measure of Damages—A lessee of the surface of land, although for 999 years, having no right to mine coal on the premises, the owner of the land is entitled to recover damages for removal of coal by the former, although the latter and his successors will not be entitled to possession of the land for several hundred years. The damages recoverable in any case for wrongful removal of coal is its value in place, if that value can be established by evidence; it being only when such proof cannot be made that the damages are measurable by the value of the coal at the pit's mouth. In computing the value of coal in place, its royalty or actual market as coal in place at the time must be considered, and not its prospective future value under changed conditions, if the coal is so located as to be marketable. (Pennsylvania Supreme Court, Trustees of Proprietors of Kingston vs. Lehigh Valley Coal Co., 88 Atlantic Reporter 763.)
COL. NOTE

Validity of Restriction on Buyer's Enjoyment of Property—Provision in a contract whereby a firm of retail coal dealers sold a teamster's outfit on condition that the buyer use the outfit exclusively in hauling coal for the sellers, is invalid, so far as it attempts to limit the buyer's title to the property, though the provision may be constued as an enforceable contract for the buyers' personal service in hauling for the sellers. (Iowa Supreme Court, Elijah & Winne vs. Mottinger, 142 Northwestern Reporter 1038.)

Discussion on Retarding Ventilation When Firing

SYNOPSIS—Explosion in a strong current of air—an incident. Reason for slowing down the fan before firing. Conditions and practice in Illinois mines discussed. History of the theory of retarding ventilation. A remarkable experiment in a Kansas mine. Effect of the supply of oxygen in mine workings. Effect of the size of mine openings. Study of the theory by the Bureau of Mines.

The president announced, in calling the meeting to order that the subject for discussion was Retarding Ventilation at Firing Time. He said, Pennsylvania does not have any retarded ventilation during firing time. I believe that Iowa, Kansas and Illinois practiced this method to some extent and I will ask Mr. Dunlop to tell us what he knows about that system.

An Incident

Mr. Dunlop (*Illinois*)—Eighteen years ago I was acting as mine manager when my attention was drawn to an explosion caused by the firing of a shot, in a new room that was in about twenty feet. There was a strong air current passing the room, on the entry. The entry was 6x8 ft. and the air was traveling with a velocity of 200 ft. per min. There were two shots fired in the room, but one did not do much work, while the other set fire to the gases, and caused the explosion. I had several explosions in the same place, and I came to the conclusion that the best thing to do was to slow down the fan during shooting time. This is a subject that an inspector must be very careful about. I would not post such a notice on the tipple. It don't apply to a mine that generates gas or has been known to generate gas.

Concluded to Slow Down Fan When Firing Shots

My conclusion after careful study was this: I felt that the reason for an explosion in a closed place of that kind was due to the gases from the explosion of the powder. I had a deal of trouble with some mine managers. Very often they said, we want more air. My experience, however, has been that the best way to avoid these explosions was to slow the fan down during shooting time, and I will say to you that, during all of my experience as inspector of mines, I have recommended this plan to all mine managers. On one occasion I recall Mr. Taylor and myself went to investigate an explosion, and I recommended this plan to the mine manager, to slow the fan down during shooting time; and they have never had any explosion since.

Now, the reason I have decided to slow the fan down is this: If you have a place just opening up, twenty feet or more, and a strong air current passing, the gases generated by the explosion of powder, do not get out of that room. The smoke is left against the wall. By retarding the ventilation these explosive gases have a better chance to expand and mix with the air; and the more they expand the less chance there is for an explosion; because they are diluted with the air, which renders the gases less explosive. Now, there is one other way, and that is to direct the air current by a curtain or brattice so as to get the gases out that are generated by the explosion of the powder. Then there will be less danger of an explosion from these generated gases. I had an explosion this year in January, nearly 600 ft. from the bottom of the downcast; and after investigation, I recommended to the superintendent to slow down his fan. All of these explosions to which I refer are in new mines and near the bottom of th downcast.

Illinois Conditions and Practice Discussed

Mr. McAllister (*Illinois*)—My theory about slowing down the fan is that if you have a slight explosion it will almost always set fire to coal dust; and for that reason, reducing the ventilation during shooting time is good; the gases become diluted with the air and are rendered less explosive.

Mr. McDermott (*Montana*)—What effect would slowing down the fan have on the coal dust that would be thrown into the air current by the shooting?

Mr. Dunlop—If you have an air current that is dusty, reducing the ventilation reduces the amount of dust in the air.

Mr. McDermott—And that is one of your reasons for advocating the reducing of the air current?

Mr. Dunlop—Yes.

Mr. Flynn (*Alabama*)—Is there any limit to the charges of powder used in the Illinois mines?

Mr. Dunlop—Yes, we have a law governing the amount of powder that may be placed in the hole.

Mr. Flynn—What is your limit?

Mr. Dunlop—Sixty inches of powder to every six feet, in thickness, of coal on a 1½-in. cartridge.

Mr. Flynn—How deep do they bore their holes?

Mr. Dunlop—Six and seven feet.

Mr. Parsons (*West Virginia*)—In the explosion that you said you had in January, you mentioned shooting rapidly two shots I think. Did you find any evidence of a blownout shot?

Mr. Dunlop—We found two holes that had been drilled there, and these holes were 6½ and 6¼ ft. One had blown out only a foot of coal and the other had just blown a little from the top. The coal was 4½ ft. in thickness.

Mr. Parsons—You say there were three shots fired in rapid succession. Now, it is impossible to have all three go off at the same time. Suppose, now, two of those shots went off first causing dust to be thrown into suspension in the air and later the third shot went off, would not this cause the dust to explode, even if you had no ventilation?

Mr. Dunlop—I think not.

Mr. Parsons—My explanation of the phenomena is that when the ventilating current is not moving the pressure is reduced and the gases are permitted to expand more freely and become diluted with the air, rendering the mixture harmless.

Mr. Muir (*West Virginia*)—Would not the same re-

Note—From the published Proceedings of the sixth annual meeting of the Mine Inspectors' Institute, U. S. A., held at Birmingham, Ala., June 10-13, 1913.

sults have been obtained if you should open up one or two breakthroughs and thus reduce the ventilation at the face?

MR. DUNLOP—That would have the same effect as slowing the fan. In reply to a question asked by Mr. Moses, Mr. Dunlop said that he had made these recommendations to a mine manager in Trenton County and had further recommended that the mine be sprinkled.

MR. PARSONS—Mr. Dunlop, what system of ventilation do you have, the blowing or the exhaust system?

MR. DUNLOP—The blowing system is generally used.

MR. PARSONS—If you were using a blower fan would not the reversing of the fan have the same effect in reducing the pressure?

MR. DUNLOP—I think not.

MR. PEARCE (*Indiana*)—In retarding the ventilation, is the idea to eliminate the initial cause of the explosion on the general explosion in the mine?

MR. DUNLOP—It is the initial explosion.

MR. MOSES (*Illinois*)—Have you known of an explosion in an Illinois mine caused by a shot that has done its work properly?

MR. DUNLOP—I remember one or two but they were local and covered very little territory.

MR. MOSES—Did you investigate the explosion at Rend City?

MR. DUNLOP—I am not sure if I did or not.

MR. MOSES—The point I am trying to make is this: You seem to give all the credit of the prevention of explosions, to retarded ventilation; and, to my mind, you do more in retarding ventilation to produce explosions.

MR. DUNLOP—I have done that for sixteen years: We have inspectors in Illinois that do not agree with the principle of retarding ventilation during firing time and I would not advocate this plan in mines in which there are explosive gases generated.

EXPLOSIONS OCCUR WHERE VENTILATION IS POOR

MR. LITTLE (*Illinois*)—Most all of the explosions we have had, in Illinois, have occurred in places where the ventilation was poor; and these explosions were caused by the excessive use of powder or misplaced holes. We have, in Illinois, what are called "shotfirers"; and we have a large number of foreign employees. The shotfirer is not supposed to know what is in the holes; he does not charge them and he fires the shots in rapid succession. In this rapid shooting, there is liberated a large quantity of gas. The shotfirer goes into a place that is beyond the last open crosscut and fires three shots, one of which may have been misplaced and the misplaced shot throws out fire and ignites the coal dust and gases that have been liberated by previous shots.

MR. MCALLISTER—In the explosion to which Mr. Dunlop refers there were only three shots fired that night; there was much dust; the coal was about 8 ft. thick; the three shots fired in that room all did their proper work. We traced the flame down to the mouth of the room. The force of the explosion blew the cars up into the tower of the shaft. We made a thorough examination after this explosion and did not find a trace of explosive gas. At another mine. near Springfield, at least 1500 lb. of powder is exploded in less than three hours.

MR. MARTIN (*West Virginia*)—How far were these shots from the entry?

MR. MCALLISTER—About 200 feet.

MR. MARTIN—Was the air current turned into this room?

MR. MCALLISTER—There was no evidence of the air being conducted up into the room; the shots were apparently fired in stagnant air.

MR. MOSES—Did that explosion occur on the first of the air or on the return current?

MR. MCALLISTER—On the return of the air.

THE HISTORY OF RETARDING VENTILATION

MR. BEARD (*New York*)—I would like to give a little of the history of the suggestion of closing down the fan at firing time. Our records are not complete; but the first mention of the subject, to my knowledge, and the first experiments ever made were by John Verner, a former mine inspector of Iowa, back in 1886, and a charter member of this Institute. It was after the Cedar Mine explosion, just west of Albia, Iowa. Mine Inspectors Thomas Binks and John Verner, together with Joe. Richardson, the mine boss, and myself went into that mine, after the explosion. It was found that the explosion occurred on the 15th or 16th west off the main south entry. On our way out, we had gone about half way to the shaft when John Verner stopped Richardson, the mine foreman, and said: "Joe, you want to open the shutter in this regulator, just before firing, or slow down the fan. By doing that you will short-circuit some of your air and have less circulation in the workings and there will be less risk of an explosion." I took exception to his theory and told Mr. Richardson that he did not want to interfere with his ventilation. That was the beginning of it.

Since that time Mr. Verner has continued to advocate that theory in the West. It has spread into Illinois and down into Kansas and Oklahoma; but whether they accepted and followed it in Oklahoma, I could not say. I think they did not. In Kansas it seems to have gotten a great hold; and this past winter we took the matter up in COAL AGE, submitting it for discussion. There were three or four remarkable letters from a man by the name of McAllister, a mine foreman at the time, in Kansas. His statements were so remarkable that after holding his letters several weeks I thought it would be a good thing to publish them for what they were worth. He claimed that the slowing down of the fan and even sealing up the upcast shaft, which retained in the mine the products of combustion due to the explosion of the powder, reduced the oxygen in the air current and rendered those gases less explosive.

EXPERIMENT IN A KANSAS MINE

Mr. McAllister went so far as to state what any of us would be strongly tempted to say was an untruth. He said he took a keg of powder and went down into the mine, in company with another fireboss; and together they fired 27 shots. They had previously placed the keg of powder in a heading and covered it over with a mound of slack. They fired this immediately after the 27 shots while he and the fireboss were in the mine, and they came out alive. Such a statement is beyond belief and would be pronounced by many as not worthy of consideration. The discussion in Coal Age, however, was valuable. We don't any of us realize as we should what value there is in the arguments of the other side. Mr. Verner is right to the extent that a reduction in the velocity of the air current when firing shots reduces

the tendency to an explosion. The discussion developed this point, and I think there is some truth there, but just how far it can be applied, I would not care to say. I am convinced of one thing, however, that there can be too much air at the time of firing. At any rate, the matter was put up as a suggestion to the Bureau of Mines and we asked them to conduct experiments along those lines.

The letters and statements to which I have referred were corroborated by the mine superintendent of one of the large mines in Kansas, who stated that any time the Bureau of Mines desired to test the matter he would throw his mines open in any and every way possible. It seemed as if there must be some conditions in Mr. McAllister's experiments with which we are not thoroughly familiar; and while I would not, for a moment, advocate tampering with the ventilation of a mine, at the same time, I must admit that it has been done successfully in a great many cases. Mr. Dunlop has just given some instances. I regard it as a question to be discussed and tested out by experiment.

Effect of Oxygen Supply

Mr. Flynn—Don't you think that the supply of oxygen at the time of the explosion has a great deal to do with the intensity of the explosion?

Mr. Beard—I do most certainly.

Mr. Flynn—Then you think that if there is less oxygen in the air at the time of firing shots there will be less liability of an explosion.

Mr. Beard—Yes, but when you have reduced the oxygen content to the point where this condition would obtain, the men might not be able to live in such an atmosphere.

Mr. Flynn—Do the same conditions obtain concerning a coal-dust explosion in a mine, as obtain in the case of a fire in a stove, by reason of the supply of oxygen? Shut off the draft in a stove and the fire goes out.

Mr. Beard—No, I think not. The two cases are quite different. In the mines, under any ordinary mining conditions, we understand that there is always enough oxygen to start an explosion of gas or dust. I cannot conceive of a mining condition without sufficient oxygen to start the explosion. There is no similarity in the comparison.

Mr. Flynn—Then you think that you can have an explosion and a propagation of the explosion with a low oxygen content as with a high percentage of oxygen.

Mr. Beard—At the initial moment of an explosion, I believe there is always enough oxygen in the mine air, under working conditions, to make that explosion possible. Now, the question of a strong draft will not only bring with it much dust but also a fresh supply of oxygen that will propagate the explosion through the mine. It is in that manner that the question of draft affects the explosion. But to say that to shut off the air current entirely and then expect to fire a number of shots in the mine, without causing an explosion, I think is open to question and grave doubt.

Mr. Flynn—Is it not a fact that the effect of slowing the fan would be to reduce the oxygen supply in the mine?

Mr. Beard—Yes.

Mr. Martin—Do you believe that at the initial point of an explosion there is a high velocity of the air?

Mr. Beard—Undoubtedly.

Mr. Martin—You stated that you believe a high velocity had a tendency to cause a mine explosion?

Mr. Beard—Yes, a high velocity of the air current passing the shot.

Mr. Martin—Don't you think that if a shot was fired, the air current traveling at a high velocity would take away the gases produced by the shot?

Mr. Beard—Yes, and supply live oxygen and dust to the atmosphere at the working face.

Mr. Cartlidge (*Illinois*)—In reading over Mr. McAllister's articles I somehow got the impression that he did not stop the fan. I don't know that the article said that, but I got the impression that he sealed up the shaft and allowed the fan to continue against a dead end.

Mr. Beard—I think you are wrong there. I think he stopped the fan and sealed the shaft, at first, at least.

Mr. Cartlidge—Here is the impression that I got: In one of his articles he stated that the superintendent wanted to shut down the fan, and close the downcast and he immediately said they would have an explosion and refused to have anything to do with it. Superintendent went ahead and had an explosion.

Mr. Beard—I think your impression is wrong.

Effect of Size of Workings

Mr. Bolt (*Illinois*)—Suppose, Mr. Beard, in a mine where they have a large area, or in other words, where they drive the entry 16 ft. wide and the roms 30 ft. wide and shoot, perhaps, 250 shots at one firing, would it not be absolutely impossible to close down the fan when firing these shots and have enough oxygen to get complete combustion in every instance?

Mr. Beard—I think it would be doubtful.

Mr. Bolt—One other question: Would it not be advantageous to retard the ventilation at firing time, provided the conditions were normal in the mine?

Mr. Beard—I am inclined to think it would be in some cases; but as I said before, in other cases, I think it would be dangerous; I would say that in a thin vein with narrow openings, the danger is greater than in a wide open mine, such as you mention.

Mr. Bolt—But Mr. Beard, most of the severe explosions that have occurred, in Illinois, in the last five or six years, have been in practically new mines where there was an abundance of ventilation.

Mr. Beard—Yes, and you must remember that those new mines are rushing out a large amount of coal and have a comparatively small area working which means a high velocity of the air current and danger.

Mr. Bolt—Why would it not be a still greater advantage where the area is small and the number of shots limited, to close down the fan entirely, and have less oxygen in the mine?

Mr. Beard—In restricted workings such as you describe, I think the safer plan is to keep the air moving at a reduced velocity.

Mr. Bolt—Then you cannot always apply the same rule to all conditions. You must apply a rule that suggests itself to conditions. There is no fixed rule. It would be dangerous to say either close down the fan or decrease its speed.

Mr. Beard—I think that is correct.

Mr. Dunlop—During the month of September, 1912, Prof. Young, of Kansas, who is, perhaps well known to most of our members, wrote an article claiming that you

cannot have too much air in a mine. He was in the mine where we had an explosion, getting samples of dust for the Illinois Geological Survey. Now, as I said, in this very mine an explosion occurred in January. The superintendent was with us; and they had just been putting in a new fan and the superintendent said: "Well, John, I guess when I get that fan started I will have to reduce the speed during shooting time." I said, "I don't think so; because I knew how Mr. Young felt about it. But, the superintendent knew that I believed as Mr. Verner had said, that we must reduce the ventilation during the time of firing shots, and it rather surprised him that I made that statement; and I will say to you now, that the speed of that fan never was reduced, until the explosion occurred in January. It may be a coincidence; but that actually occurred. Since that time, the speed of the fan has been reduced, during firing time.

THE BUREAU OF MINES STUDYING THE PROBLEM

MR. PAUL (*Pennsylvania*)—I have read the articles which have appeared in the public press and journals concerning the effectiveness of reducing ventilation during firing time; and particularly have I noted and studied the articles contributed, in COAL AGE, by Mr. McAllister, of Kansas. Probably a year or a year and a half prior to the appearance of these articles in COAL AGE, I had the opportunity to peruse the original manuscript. There were some statements made in that article that caused me to question the correctness of the facts as stated by Mr. McAllister. One thing in particular aroused my suspicion. He stated that in one of the mines in which an explosion had occurred he immediately descended the shaft, and found in the center of the entry, a current of pure air, and following that current of air he rescued some men. In all of my experiences in mines, following explosions, I have never found a column of pure air, so located, or air in the center of an entry, which varied much from the air against the roof or on the bottom.

In regard to reducing ventilation during firing time, we have had statements from Mr. Verner, of Iowa, in regard to the effect of retarding ventilation at firing time. And Mr. Rhys, one of the present mine inspectors of that state, shows there has been no prevention of explosions by reason of retarding the ventilation. In Kansas, where they practice retarding the ventilation, we have no facts available with regard to explosions occurring when they did not reduce the ventilation. We do know that Kansas has had a large number of explosions within recent years; a great many in mines where they have had retarded ventilation, resulting in a small loss of life.

The question resolves itself into one requiring the study of phenomena attending the retarding of ventilation. Some investigation is now being made by the Bureau with a view of determining whether or not there is any efficacy in retarding ventilation during firing time. A statement was recently made by a Liverpool professor, in which he advocated reducing the oxygen content of the mine air, as a means of preventing explosions. That theory has been largely criticized and I believe COAL AGE has written a plausible and just criticism of it. Experiments made in the laboratory of the Bureau of Mines have not confirmed all the statements made by that professor in regard to the diminution of oxygen in the air. I speak of this since it has appeared in public print. Experiments are now under way at Pittsburgh to determine the effect of diminishing the quantity of oxygen in the air with regard to the propagation of a dust explosion, and I regret on this occasion that our Mr. Hall is not present to give you a summary of some of the preliminary tests that have been made. The statements I make in regard to those tests, are subject to his verification later; but I believe he has found by diminishing the quantity of oxygen in the air to about 2 per cent. below the normal content, a dust explosion is not propagated, owing to the lack of sufficient oxygen to furnish complete combustion.

It seems to me, therefore, that this discussion resolves itself into a technical question concerning the oxygen content of the mine atmosphere. Another feature of the question might be the agitation of the mine air. It is found in laboratory experiments on a large scale, that if you have a mixture of air and explosive gas in the proportion in which it creates the most violent explosion, the air and gas being thoroughly mixed and in a quiescent state, and ignite it, you get a low explosive force; but if you agitate the same mixture of gas and air, before igniting it, you will get a much more violent explosion.

So far as the effect of retarding the air current, in dust explosions, the mere fact that you have retarded the air current and prevented the agitation of the air may be responsible for the lack of propagation of the explosion; but this is a conjecture since it has not as yet been proven by experiments, on a large scale. Analyses taken throughout the country show that it requires an extremely poorly ventilated mine to carry an oxygen content much less than the normal amount in the atmosphere.

Commendation

The following letter comes to us from one of the assistant firebosses in a mine requiring careful inspection. It comes from one who is evidently appreciative not only of the efforts of his employers to carry out the mining law in respect to the safety of the mine; but likewise of the thorough work of the state mine inspector in that district. COAL AGE congratulates both the management of the mine and the inspector on the result.

"I want to commend our mine inspector for the thorough manner in which he regularly performs his work, in seeing that the requirements of the mining law are met in respect to the safety of lives and property. Anyone who has observed Mine Inspector Elias Phillips, on his rounds of inspection in the mines, would be satisfied that he is a credit to the inspection department of the state. Unlike some inspectors I have seen, who never leave the main entries, Mr. Phillips inspects every hole and corner thoroughly, and makes his inspection like one of the assistant foremen or the mine foreman himself.

"I would say, also, to the credit of our general superintendent and our mine foreman, that they comply with every order of the inspector to the best of their ability. This mine is one of the hardest mines to handle, in the state, because of a difficult roof and much water. But, as a result of this good work and coöperation, I am proud to say only one fatal accident has occurred in this mine during the past year."

Details of Mining Methods

By W. H. Grady*

SYNOPSIS—Explains the difficulties in drawing pillars after they have been allowed to stand and details some of the precautions which should be taken to obtain safety and maximum recovery. A preliminary statement showing the defects of room-and-pillar methods as are quite frequently adopted.

No attempt will be made in this paper to outline the details of all the methods of mining coal; rather it is my desire to refer to the room-and-pillar method of mining, which, in its various modifications, may be said to be the prevailing method of extracting coal in this country. However, some longwall mining is done, especially through the Middle West, and, as the market value of coal rises, it is quite probable that the latter method will become more general in the thinner seams of coal, which cannot be mined with profit.

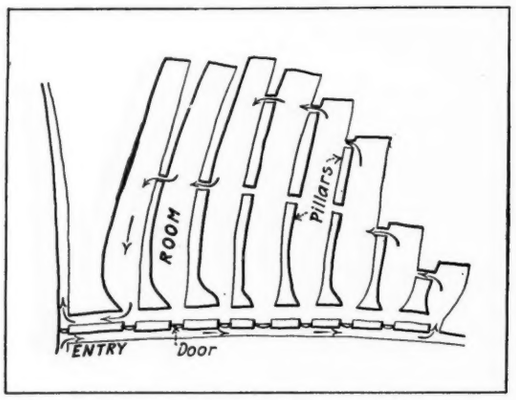


Fig. 1. The Simplest Form of Room-and-Pillar Work—Unsafe and Wasteful

First Cost Versus Final Cost

In the early days of mining in this country, that system which yielded an output at a minimum cost under conditions then existing, was adopted without any thought of how the remaining coal in the ground was to be mined, and the same influencing factor is dominating the methods of operators in some of the mines of today. Coal was little known, its uses were limited, the methods of mining were crude, so that the operators, all of whom were of limited capital, did not seek for what would be the most economical method in the long run, but for that plan by which they could mine coal cheaply and quickly at the commencement of the operation.

As a result large areas were opened and not only were the long-standing pillars subjected to the deteriorating effects of the air but they were constantly injured by the overlying weight. These methods had but one favorable feature and that was but temporary, for though the coal could under the slipshod system, then in use, be mined cheaply, there was a subsequent loss of coal from "V"-shaped robbing, much crushing of pillars, many creeps, large expense from the cleaning up of falls, increased timbering and duplicate trackwork. So that the time is approaching, in fact its advent is already announced, at many mines, when the cost of mining coal in the old workings will be much higher than it now is. In addition, much valuable coal in pillars will be entirely lost.

A Percentage Recovery of 90 Per Cent. without Materially Increased Cost

To avoid these losses operators have realized that they must use methods which make mining costs almost prohibitive or else a system by which only 60 to 65 per cent.

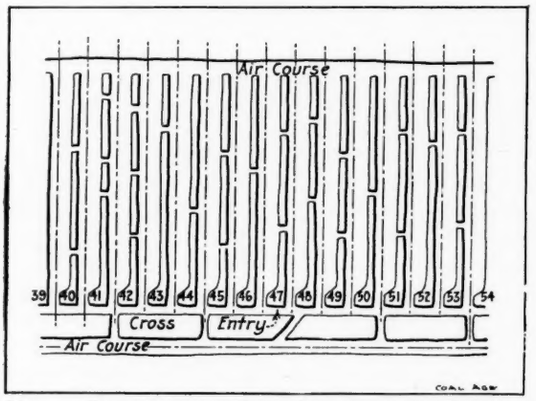


Fig. 2. The Use of Two Entries and Rooms Driven on Sights

of the coal is recovered. Facing such alternatives, they are proud to have lighted on a modification of the old method which differs from it only in detail, and yet gives them a recovery of 85 to 95 per cent., or even more.

That such a great difference in the percentage recovery has been brought about without materially increasing the cost per ton, is all the more to the credit of coal-mining men and places them among true conservationists.

The Simplest System

The simplest form of the room-and-pillar system of mining, may be said to consist entirely of rooms turned off an entry, leaving a pillar between each room turned, as in Fig. 1. This method may be said to yield the greatest number of working places per unit length of entry. Fig. 1 is a reproduction of actual mine workings which came under my observation in the last few years and represents room-and-pillar work in its most dangerous form.

A later step was to drive two entries with rooms off each. This insured somewhat better ventilation. But, as will be shown later, this method will not permit the recovery of the maximum amount of coal at a minimum mining cost.

Where much coal is to be handled, the double-entry system with rooms off both entries presents operating difficulties which are sought to be overcome by driving rooms off one entry, using it as a return airway and haulage road and reserving the other entry as an intake for

*Chief mine inspector, Pocahontas Coal & Coke Co., 133 Giles St., Bluefield, Va.

Note—First part of an article entitled "Some Details of Mining Methods with Special Reference to the Maximum of Recovery" read before the West Virginia Coal Mining Institute, Dec. 9, 1913.

air only. Fig. 2, an example of this method, is a step in the right direction and a great improvement, but for large properties where mining is done extensively, a further improvement must be made.

Leaving Pillars Till Mine Is Finished

Formerly, entries were driven and worked by one of the methods above, and the greater part of a property was developed, before the work of removing the pillars began. Robbing pillars brought on new difficulties which were sometimes calamitous. The thin pillars, became so strained, often before robbing had been attempted, that they could no longer support the mountain or overburden and they failed by crushing at the point of greatest weakness so that the mountain or overburden tottered.

Once "tottering," "squeezing," or "creeping" or all three actions together sets in, pillar after pillar is crushed, the destruction spreading, sometimes with the rapidity of a prairie fire. Until sufficient barriers or areas of solid coal are reached, capable of counteracting this now tremendous dynamic force, no available power can stop it. Sometimes such a squeeze will destroy acres

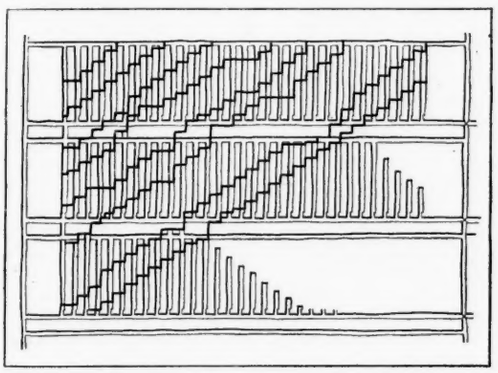


Fig. 3. Lines of Fracture across Three Headings Worked as a Unit by Room-and-Pillar Retreating Method

of pillar coal and render impossible or expensive the mining of other coal lying beyond the affected area which is only accessible through the squeezed territory.

I have in mind an instance where over 75 acres of pillars were crushed so badly, in a period of less than two weeks time, that all hope of ever recovering them was abandoned. Another example of the toll a squeeze demands is the loss of life in the Twin Shaft disaster in the Wyoming region of the Pennsylvania anthracite field, where men were buried alive, whose bodies have never been recovered.

These difficulties and the great expense, attendant on relaying track and cleaning up slate falls with which the pillars were so frequently congested, brought a further change in the room-and-pillar method of mining, whereby the pillars could be more economically extracted, and in the event of a squeeze starting it could be controlled. It developed what is known as the "panel system" of room-and-pillar work as shown in Fig. 3.

This panel system may be said to represent the better practice of today. It is pertinent, therefore, to know what size of panel, width of entries, width and depth of rooms and size of pillars will insure against squeezes and yield the maximum of recovery at a minimum of expenditure.

The overlying burden is often thought to be the determining factor in regard to room widths and size of pillars, but in general it determines the *minimum* size of pillars and the *maximum* width of room only, which may be materially different from the size of pillar-and-room width as determined by other factors.

However, a full knowledge of the manner in which the weight of the roof tends to act should be thoroughly understood in order that we may determine approximately what will happen when the coal is being worked and the pillars extracted. For an excellent analysis of this question of roof weights and action, I would refer to the papers of H. W. G. Halbaum, entitled "The Action, Influence and Control of the Roof;" and, "Great Planes of Strain in the Absolute Roof of Mines." These papers appeared in the "Transactions" of the North of England Institute of Mining and Mechanical Engineers.

Halbaum's Hypothesis

Briefly there are two forces acting which compose the total roof action, a vertical force acting downward and a horizontal force acting opposite to the direction in

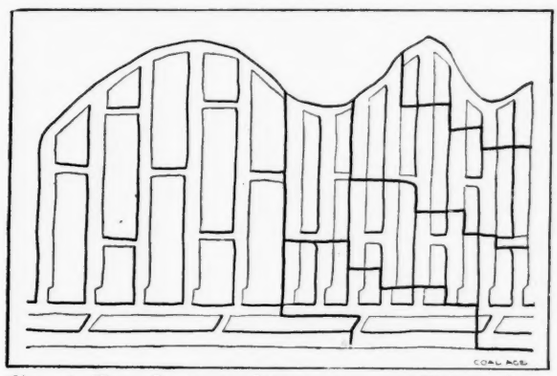


Fig. 4. The Outcrop Rooms on the Right Are Sure to Fill with Slate, and Pillars Are Too Narrow to Split or Slab

which the workings are advancing. The resultant of these two forces is in a direction from over the solid coal toward the excavated area and tends to break the roof over the pillars so that one must be constantly alert for such action.

When the pillars are not mined clean, the strata overlying the excavated area are not allowed to break and rest freely on the bottom.

The tendency often is for the roof not to break but to sag gradually until at some distant point in the gob, it reaches the bottom. This gradual subsidence of the roof often will be so severe as to crush the end of the pillars next to the gob and prevent miners from getting cars to the point where they desire to load them, thus causing more incomplete pillar extraction. Often when this stage is reached it will be found that neither the setting of props nor their removal will affect the action of the roof.

In general it may be said that so far as the weight of the roof is concerned, the pillars should be of the following dimensions:

PILLARS FOR VARIOUS DEPTHS

Depth of cover, ft.	Width of pillars, ft.	Width of rooms, ft.
300	15	20
500	20	20
700	25	20
900	30	20
1200	35	20

Why Uniform Pillars Are Used Despite Varying Cover

Ordinarily the pillars and rooms, within certain limits, are made of uniform size, in the same mine or group of mines, notwithstanding the variations in cover, which may be encountered in mining.

For example, the size of the room pillars required under a ravine where the cover is only 150 ft. thick should be 15x80 ft. and underneath the mountain top where the cover is 475 ft., the size of the pillars should be 20x 80 ft. As a matter of fact, all are somewhat larger than the maximum size required according to the table, because the pillars should not only be large enough to support the weight of the roof while the rooms are being driven, but also at the time the pillars are being robbed back.

To change room spacing would involve a further complication, conducive to losses of coal, in that the small pillars would be robbed back more quickly than the larger ones and an irregular breakline would result, with some pillars extending far back into the gob. These would be inevitably crushed.

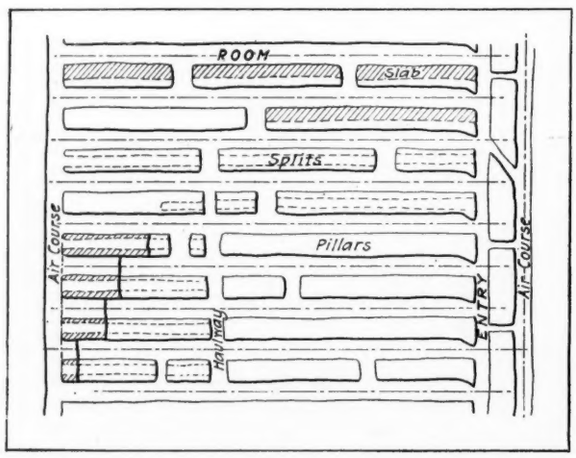


Fig. 5. Method of Recovery of Pillars by Slabbing and Splitting. In Lower Five Rooms the Splitting Is to Be Done in Two or More Lifts from Counter Haulways

Where Pressure Is Light, the Pillars and Pillar-Footings Are Usually Weak

An error that is sometimes made in drift mining is to suppose that because workings are near the outcrop and the cover light, wide rooms on narrow centers may be driven. While it is true that the cover is light, as a rule it is so badly weathered that it has little strength and before mining has proceeded very far the rooms will become congested with slate falls, and splitting of the pillars will become imperative. The dead weight resting on the wings of the pillars soon crushes them and a squeeze may result, causing large losses of coal. Fig. 4 illustrates two systems of crop working with different room spacing.

Large Pillars and Narrow Rooms Needed under Both Weak and Strong Tops

Probably no one factor contributes more to determine the working size of the pillars than the nature of the top and bottom immediately adjacent to the coal. Their behavior, especially that of the top, under the forces acting during robbing, the weathering effects of the air, the effect of temperature changes upon the top and its ability to withstand tension, compression and shear are all of prime importance.

If the roof is a material which cannot resist these agencies, it will fall very probably before the pillars are robbed, so that cleaning up slate falls becomes a daily occurence, and so great are the delays and expense occasioned, that the cost becomes prohibitive; incomplete mining is certain; a squeeze occurs and much good coal is lost.

On the other hand, if the top is a strong sandstone the impression is common that wide rooms may be driven and only small pillars are necessary. Because of the great strength of the top and the absence of slate falls, the time of starting the robbing is a matter that receives very little attention.

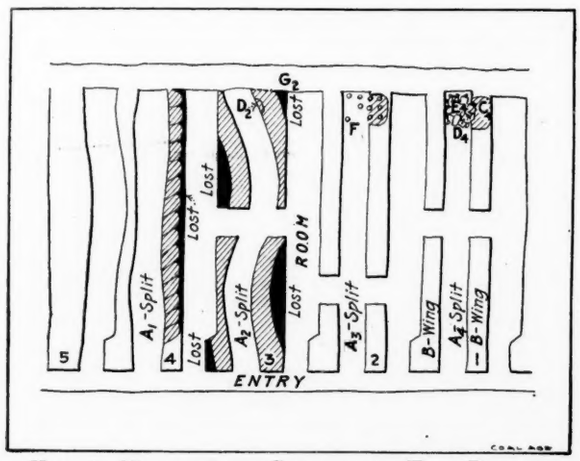


Fig. 6. Methods of Splitting. The Black Areas Show Coal Lost When Roadways Are Not Straight. When Roof Falls against Standing Ribs, the Roof Rock Mixes with the Coal

Under either strong or weak top, large pillars and narrow rooms are imperative and the robbing should follow within a reasonably short time after completion of the room.

Cleaning Out Pillars in Old Workings

Fig. 5 is an example of an honest effort to obtain the coal in the pillars, when, by reason of slate falls or crushing, the pillars cannot be drawn back in the ordinary way. Wide deep rooms were driven on narrow centers, under very weak top which was known not to stand weathering well and fell for a height of from 5 to 15 ft. and even more. The rooms were driven during the years 1898-99 and under the system then practiced at the mine, robbing did not follow. Extracting the pillars was started in the year 1907.

All the rooms were congested with slate falls and the work was started by slabbing. By this method the miner was continually retreating from his solid work and placing himself in danger from the bad roof overhead. When the miner was ready to come back with the remaining portion of the pillar, it was often found to be so badly

crushed that only a partial recovery could be obtained and frequently slate falls would close the space in.

Splitting the pillar from the entry to the aircourse above proved to be a failure because the wings could not support the load coming upon them and the timber cost of attempting to recover the pillars in this way became prohibitive. Finally in an honest effort to recover the coal, if at all possible, counter haulways were driven across the pillars and the falls met in crossing the rooms were cleaned up.

Counters and Short Splits

Then short splits were driven up the pillars from the counter haulway, and the wings quickly robbed back before they became so weakened that their recovery was impossible. This resulted in the maximum of recovery under the circumstances, but the expenditure for handling slate falls, relaying track, timbering, and other items made this coal more than twice as expensive as the coal produced in normal parts of the mine.

If the roof is weak so that "robbing falls" occur quickly after the removal of the coal, a maximum recovery at minimum cost can never be obtained by splitting the pillars and loading out the wings. It is easy to see that the "robbing falls" resulting from the removal of one wing, will prevent the complete mining of the other, unless a sufficient quantity of timber is used to ward off the fall. This timber later interferes with a satisfactory fall at the time such a breaking of the roof is desired.

The Pillar-Splitting Problem

Fig. 6 is a cut of several pillars which are being pulled back by splitting. A_4 shows the split in the pillar, with the wings *B-B* remaining, C_4 shows a portion of the right wing removed by attacking the pillar at the point D_4. The shaded area E_4 represents the fall which occurs, keeping the miner from the extreme inside portion of the left wing. If this fall is warded off, good sound timber will have to be used freely as shown at *F*.

What more frequently happens is that the split in the pillar is driven as at A_2 and the pillar is attacked at D_2, but all of the coal is not mined. A good sized stump of coal as at G_2 is left behind to support the roof, the quantity of good coal lost depending on the thickness of the seam. All the way back to the entry, some of the coal is left.

Sometimes it is mined as at A_1, leaving a shell of coal on both wings all the way back to the heading. The miner loading the coal from the wings is often apt to leave a larger shell than he supposes, as a result of poor alignment of the split or of the room and this large quantity of coal acts as a fulcrum or pivotal point, preventing a good clean fall of the roof.

Thus the weight which should be on the bottom is thrown onto some nearby pillar, causing it to be unduly strained, and if the number of pillars working is great and the losses of coal occur too frequently within a limited area, a squeeze may result which will cause serious losses of coal.

Loading an Old Slack Pile

By F. W. Whiteside*

The recent Colorado coal strike, which was called Sept. 23, 1913—while unable to tie up all the mines in any of the coal-mining districts—has caused suspension of operations in a sufficient number in Fremont County to curtail the output seriously. But three properties, two of which belong to the Victor-American Fuel Co., are now running.

The Loaded Scoop Nearing Discharge Point and Returning after Being Dumped

In this district are located the Ideal and Concrete Portland Cement plants; two of the power plants of the Arkansas Valley Ry. Light & Power Co., the United Oil Co.'s refinery, and a number of smaller concerns, all of which consume a large quantity of slack coal.

To meet the shortage of production, a contract was let to the firm of Fox and Smith to load coal from some of the old slack storage or better waste piles at Coal Creek and Magnet mines, upon railroad cars for shipment to the plants above enumerated.

The contractors who have undertaken to load this coal, have a somewhat unique plant consisting of a 50-hp. a.c. electric motor, a double drum drag-line hoist and a large

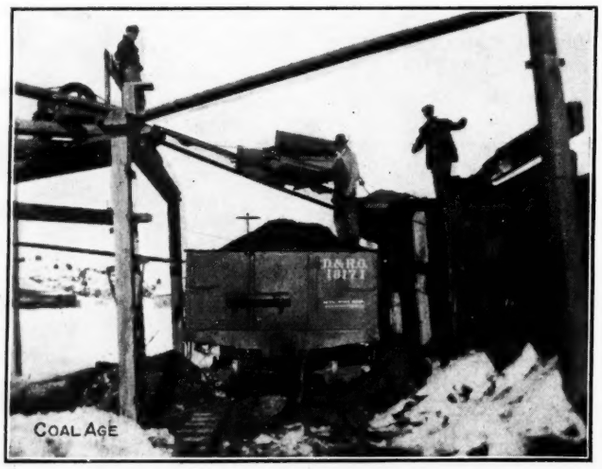
*Chief engineer, Victor-American Fuel Co., Denver, Colo.

scraper or scoop. The operation can best be likened to a main and tail rope mine-haulage system in which the scraper takes the place of the coal trip. The scraper presents an advantage, in that it dumps without being detached from the ropes.

The electric motor and hoist are mounted upon the same floor system, which is provided with lateral skids, enabling it to be moved upon rollers as a unit whenever a change in position becomes necessary.

By changing the location of the tail-rope sheave directly behind the drag scraper, an immediate adjustment in the course of travel of the latter is effected, so that by this means and by a slight altering of the head sheave just in front of it, a wide range of territory can be covered without moving the hoist.

The best day's run loaded twelve 100,000 lb. capacity steel gondolas to their fullest capacity. An average of nine cars in eight hours, including moving and delays, is easily obtained. The operation of loading can be han-



THE SCOOP JUST AFTER DUMPING

dled by two men, although more are required when it becomes necessary to move the hoist.

The power is charged to the contractors at a flat price per month, but as it is less than the cost of a single laborer, it is readily seen that the expense of loading per ton is very light, and the speed of operation reasonably great.

It is quite possible that a much higher capacity could be maintained, but in the case before us the actual demand had to be considered, and the supply regulated accordingly.

From the above it will readily be seen that by this method slack can be loaded both cheaply and effectively; much more so than with a dipper, as the speed of operation of the drag is considerably greater.

By mixing this material with new slack direct from the mines, good results are obtained, excepting in the case of the cement kilns, where it is necessary to use undiluted fresh slack.

Coal Mining Institute of America

An executive meeting of the directors of the Coal Mining Institute of America, was held Jan. 8, at 2 p.m. in the offices of W. E. Fohl, Farmers Bank Building, Pittsburgh, Penn.; Jesse K. Johnston, I. G. Roby, A. P. Cameron, Joseph Knapper, W. Seddon, and C. L. Fay being in attendance, also S. B. Smith by invitation of the president.

Mr. Johnston reported that inquiries made from 50 members, revealed a desire to make the papers and discussion follow lines interesting to the general run of mining men avoiding the more technical subjects. It was suggested that the secretary should urge on operators the advantage of having their fire bosses and foremen present at the semiannual meetings.

MEETING TO BE HELD IN BIRTHPLACE OF INSTITUTE

The summer meeting was arranged to take place at Monongahela, Penn., that being the birthplace of the Institute. The date was left for later determination, but it will be in June and so arranged as to avoid conflict with the Mine Inspectors Institute of the United States, which is held on the second Tuesday in June and this year occurs on the 9th.

A local committee was named to make arrangements at Monongahela, with Alexander McCanch, state mine inspector, chairman.

The other committeemen are Henry Loutitt, the first president and former mine inspector, William Bird, H. T. Booker and W. A. Luce.

It is too early to give the program in detail, but a paper will be read on the Lake Erie and Ohio River Ship Canal. Timbering methods will be discussed by J. M. Armstrong and William Seddon. Possible substitutes for mine posts will also be discussed and correct methods of timbering will be illustrated by stereoptican views. A. P. Cameron will discuss "Accidents Caused by Machine Mining As Against Pick Mining" and a paper is expected on efficiency methods in mining as exemplified in actual practice.

Mine Explosion in Alabama

BY SPECIAL CORRESPONDENCE

A local gas explosion occurred in the Rock Castle mines of the Davis Creek Coal Co., 30 miles southwest of Birmingham, Ala., on Saturday morning, Jan. 10, killing twelve men. Gas had been reported that morning by a fireboss, in three rooms on the seventh right entry.

After the miners went to work, a mine foreman and a brattice man went down in the mine to investigate the presence of the gas. The explosion followed soon after their entrance, killing them and all the others in that entry; the balance of the mine was not affected. The bodies were recovered by 7 p.m. They were all horribly burned and the men had in all probability been killed instantly. Ninety men were in the mine at the time of the explosion.

Engineers Society of Northeastern Pennsylvania

The Seventeenth Annual Dinner of the Engineers Society of Northeastern Pennsylvania will be held at Hotel Jermyn, Scranton, Thursday evening, Feb. 5, at six-thirty o'clock. The cost per plate will be $3.50. As in the past, members will have the privilege of bringing guests, provided one week's notice is given. Tickets for guests may be procured from the Ticket Committee.

Editorials

Looking Ahead

At no time in recent years has the business outlook in coal mining appeared brighter. We are gradually reaching a point in the fuel industries where producers pay more regard to the demands of the markets. It is no longer easy to open a mine by simply building a railroad dump and driving a drift into the seams. Desirable coal lands near good markets are not available in quantity except at a stiff price. It is also true that recent legislation to safeguard miners has shouldered the owner with an expense for equipment and operation that cannot be borne by the small individual.

All this means that the consumer will have to pay more for his coal, but he will not complain when it is made clear to him that the additional cost is utilized to conserve both men and mineral. Coal mining is the one great industry of the nation where there is no margin of profit for lawmakers to lay a tax upon. The cost of improved conditions must be added to the market price of the fuel we burn in our homes and factories.

And there is no sincere regret to be expressed at the passing of the small operator. His methods were the most disturbing influence in the industry. He found it practically impossible to make money himself, and prevented the larger corporations from doing a satisfactory business.

That conditions in the bituminous industry are tending toward greater stability is the belief of all those who are well informed in coal matters. We have in this country practically inexhaustable supplies of natural fuel, but it is likely that the coming revival in general business will find our mines none too big to satisfy the demands that will be made upon them.

Of course, we have all heard it said that we could immediately double our annual output with the mines now operating, but the statement lacks truth. At the present time, it is a fact that most of the days and hours when our collieries are not working, are given over to necessary repairs to machinery, to the placing of timbers, and to cleaning the underground workings generally. It is fallacious to say that because a shaft will produce 1500 tons in 8 hours, the same shaft and mine by working double shifts, can be made to produce 3000 tons for each of the possible 300 working days of the year.

We hazard the suggestion that American coal operators would have difficulty this year in adding 25 per cent. to the coal production of the United States if called upon to do so. And when we consider that in case of a nation-wide improvement in business, the present railroad equipment of the country would be inadequate, it becomes evident that a few outside influences must be reckoned with.

We sincerely hope that transportation facilities and mine capacity will be the only determining factors in 1914, however, it is a stretch of optimism to believe that "wage scales" this spring will be renewed without some trying moments. It is to be hoped, however, that arrangements will be satisfactorily concluded whereby the mines can continue in operation even though new contracts are not signed by Mar. 31, when present agreements expire.

The year 1914 in coal mining can be made a period of record prosperity for operator and miner alike if each will exercise great forbearance in his dealings these next few weeks. Every evil cannot be remedied in a day, and some sore spots still remain in the coal business; however, general conditions in our mines and camps are so far improved beyond what they were a few years ago, that a look backward can leave no doubt concerning the rapid progress that has been made.

Of course, if we manufactured automobiles instead of mining coal, our labor disputes would be at an end, for we would only have to hand out a few millions of profits and strikes would be matters of ancient history. But there! that is idle conjecture, for automobiles are luxuries while coal, like food, is a necessity. According to common parlance, a necessity is something we *ought* to have, but a luxury, such as our motor car, ah! that's different, that's something we *must* have.

Kincaid, Illinois

Our readers will find in the Sociological Department a description of Kincaid, but we think that most will find the principal interest not in the village as such, but in the light the article throws on the attempt of the operator to avoid the fierce competition of the coal market and work his way into the power-selling industry.

There are altogether too many artificial conditions in the life in which we live and some arise from the attempt of some people to get just what they want, regardless of the expense it may take to get it. When the producer and the buyer are one, there is immediately an endeavor to modify the demands of the latter to meet the producer's ability to supply those requirements.

If the miners get the right to shoot coal out of the solid, there are several ways to avoid the loss which results from this provision. They can be made to undermine their coal by hand, by a contract which expressly requires it; they can be supplied and required to use undercutting machines, or the market can be brought to accept slack. Eventually we believe that small coal will be the general demand of the market and the only question remains whether we shall use slack or pulverized coal. But for the present, the operator can only keep the slack for his own use and sell the large coal to the manufacturer or railroad if he would make a profit.

The requirements of low sulphur and ash are largely removed when power is generated at the mine. When he consumes all or the bulk of the coal he mines, the coal operator is enabled to make the boiler equipment suit his coal and thus get better satisfaction from it than it would give in the general market.

So long as the operator uses his large coal to run his plant, so long it will be hard for him to force fine coal on

an unwilling market. When he is using the slack himself, both he and his force of salesmen can with justice urge the installation of slack-burning furnaces. When all the coal is shipped in that form, there will be less pilfering from the cars and it will no longer be true that slack is lower in thermal units than the larger product and has, in many cases, a greater readiness to clinker.

Moreover, many coals which in the market are not meeting with success, we shall find a way to burn when there is a demand for power at the mine. The outward appearance or the analysis or a low clinkering temperature will not suffice to condemn a coal if a method can be found of burning the fuel with efficiency. The more will this be true because the impurity will not have to be hauled a hundred or more miles with the coal with resultant increased cost for pure fuel substance at the point of delivery. Nor will the ash have to be carted several miles into the country or loaded in railroad cars when coal is burned at the colliery power plant.

Fortunately the Christian County coal is of remarkable purity and probably the Peabody operation is in no need of any or all the advantages described, but there are many plants where a central station for power sale would make all the difference between bankruptcy and success.

Certain it is that combinations which follow a product all through its modifications as iron ore to finished steel, or coal to delivered power, conserve our natural resources and our labor even more than those trusts which working as it were horizontally, combine all those who are engaged in promoting a single process in the whole chain development.

These vertical trusts are those which should be fostered for the good of the public for they do not restrain the freedom of business unless the products or some of the products they deliver are sold by them in such large proportion of those from all sources as to restrict competition in them.

The Labor Union

The labor union is a menace to the country but so are the combinations of operators. We sincerely hope that the nation will never tie its hands in dealing with either when the time for action arrives. If either tries to obtain a strangle hold on the public, let there still be a power in the courts to declare that the laws of the game of life are being violated.

We believe that the Sherman bill, if its true meaning be taken without any "light of reason," condemns all labor unions as combinations in restraint of trade and declares the interstate agreement a violation of law. But like Mr. Seager, in his remarks on p. 114, we believe that if workingmen cannot form a union legally, they should receive that power, but the purposes of their association should be strictly limited and accurately defined.

Perhaps the British law of 1875 that what is right for one man is not wrong for an association, would apply without harm to trades unions, but we cannot be satisfied with its applications to combinations of producers and manufacturers. One man can, without wrong, place his prices as high as he pleases, but it does not seem well to permit a combination of men to conspire to raise prices 100 or 1000 per cent. with legislative approval and consent. Try as we will, we find it hard to bind the laborer with the same cords as his employer without making labor unionism completely illegal or placing trusts largely under the protection of the law. This the British law and Mr. Seager do not fail to recognize.

But between making the confession that we cannot restrain trades unionism altogether and permitting it to go utterly wild to the destruction of the country, there are many intermediate stages. We are convinced that the closed shop and the button strike, with or without an agreement, are as clearly infringements on the rights of the workingman as was the old "iron-clad" agreement which operators made employees sign in the earlier days of mining history. We are convinced that sympathy strikes and those which are continued against operators who are willing to concede the wage scale are opposed not only to the Sherman law but to every reasonable moral code.

Stampeding the body politic is tantamount to treason and fortunately it has not been common in this country. We hope it may never be, but we would as soon fail to provide against it by law as blot out Art. 3, Sec. 3 of the United States Constitution against treason, because the practice of such perfidy has become infrequent.

We have a difficult problem in this country. Those whose wrongs most appeal to us abroad are the very persons who, admitted to citizenship or to the country, make the most dangerous people. They may not have sufficient knowledge of our language or customs to be leaders, but they are always ready to follow. Centuries of oppression have given them a readiness to resist and a power of believing anything of those to whom they are opposed. The Finn and the Pole are often far from being grateful for what they receive and are more confident than any others that they are being wronged. Knowing full well the greed with which they would be animated were they in the ascendant, they cannot credit anyone with even a passing interest in their welfare.

It speaks well for the American heart but not for the American brain that the public of this country is willing always to assume that the foreigner is right whenever his protest takes a riotous aspect. Perhaps the citizens of Routt County, Colorado, and Houghton, Mich., have a right understanding of the difficulties at issue. Like Mrs. Pankhurst, many of the disturbers of the peace thank providence that they live in times of oppression, for they do so dearly like a fight.

Uniformity in Annual Reports of State Mine Inspectors

In compiling the data for our annual statistical number, which appeared last week, considerable trouble was experienced through the lack of a common basis of calculation on the part of the various state mine inspectors. Several states make their coal report for the fiscal year ending June 30. Others report for the year ending Sept. 30, and one state report covers the twelve months ending Oct. 31. And this is not the only point of difference. Several inspectors made their estimates on a basis of gross tons, which basis of calculating output is sure to be highly misleading.

Why can't we all get together on common ground and make an annual report of the coal business in short tons for the regular calendar year ending Dec. 31?

Sociological Department

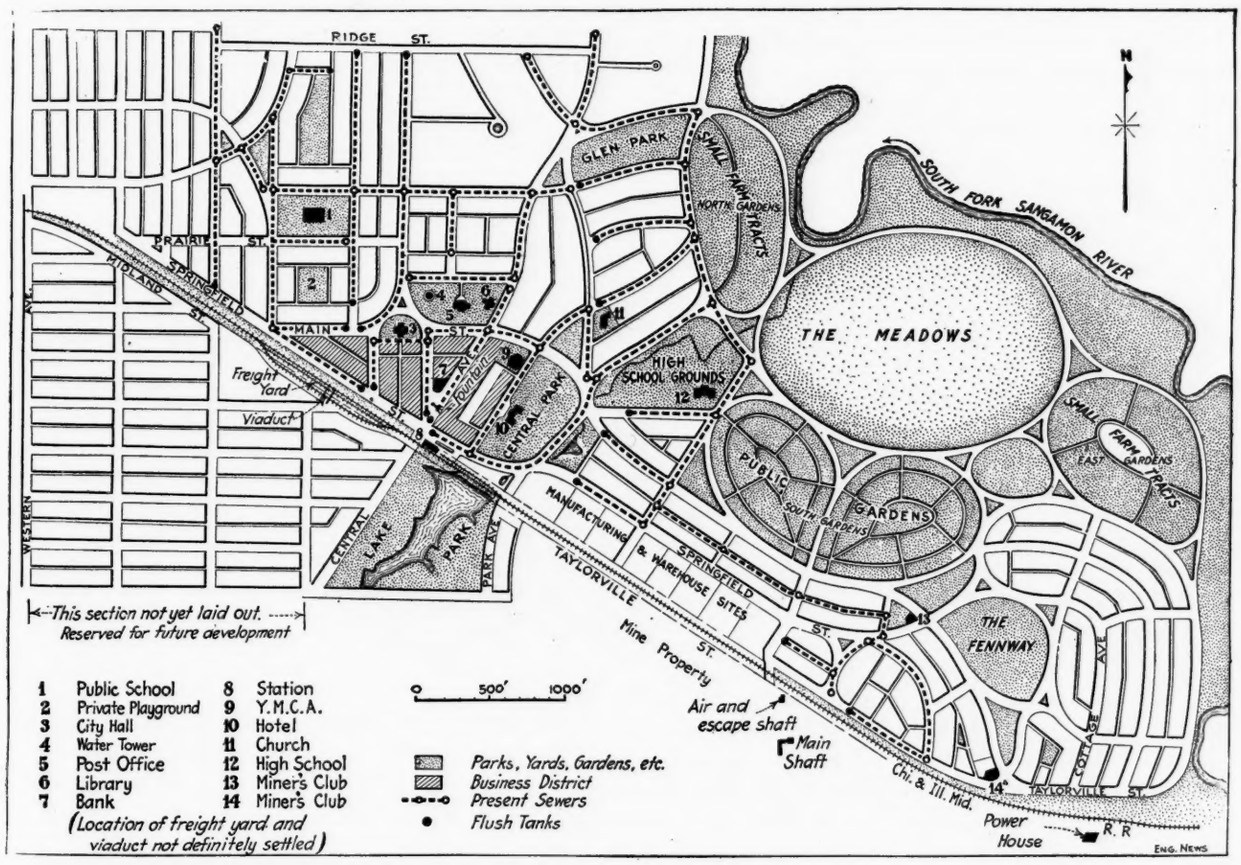
Peabody's New Coal Town in Illinois

SYNOPSIS—F. S. Peabody and S. Insull are building a model town for coal miners and others, at Kincaid, Ill. The builders planned their town with the help of John Mitchell, formerly president of the United Mine Workers of America.

A new town now under construction in Illinois is of special interest in that it is located in open farming country at some distance from any center of population, and that its design has been unhampered by any considerations or conditions of existing utilities. The distinct and interesting feature of this enterprise is the application of practical town-planning ideas for an average population in a coal-mining district.

The town is being established by F. S. Peabody and Samuel Insull, of Chicago, mainly as a place of residence for the miners of a coal-mining property recently placed in operation near the townsite and for the operatives of a large electric power station. They represent the Peabody Coal Co. and the Central Illinois Public Service Co.

While the purpose of the enterprise is commercial, it is being carried out on modern lines in regard to planning, public utilities, housing and sociological conditions. At the same time care has been taken to avoid mere beautification and to keep the practical purposes and limitations of the project strictly in mind. For this purpose the owners had frequent consultations with John Mitchell, formerly president of the United Mine Workers of America.



PLAN OF THE NEW COAL TOWN OF KINCAID, ILL.

THE TOWNSITE

This new town, which has been named Kincaid, is almost in the center of the state, about 20 miles south of Springfield (or 200 miles south of Chicago) and 100 miles north of St. Louis, Mo. It is on a short railway line running west from Taylorville, where it connects with the Wabash R.R. and Baltimore & Ohio Southwestern R.R. The line crosses the Illinois Central R.R. at Pawnee Junction, and extends to Auburn, where it connects with the Chicago & Alton R.R., a total distance of 26 miles.

This railway, the Chicago & Illinois Midland R.R., is

Note—Reprint from "Engineering News" of Jan. 8.

owned by the same interests which own the mines and the new city, and affords a connection with the four large railway systems noted above. At present, the miners live mainly at Taylorville, 8 miles distant, and go to and from work by trains on the local railway.

The area of the site is about one square mile. It is located on the south fork of the Sangamon River, partly on low-lying and partly on undulating land, the maximum difference in elevation being about 40 ft. The soil is black loam to a depth of 2 ft., underlaid by compact clay, with the first coal measure at about 35 ft. below the surface. The plan for the city includes a business district, two residence districts for buildings of the cheaper and better classes, respectively, and an extensive area of park and garden lands. The bank will be owned by Mr. Peabody. The miners' clubs will be operated under control, in order that the liquor problem may be regulated. The design provides for a present and ultimate population of 3000 and 5000.

Paved Streets and a Sewer System

The width of the main streets in the business district is 80 ft., with a 40-ft. roadway and 20-ft. sidewalks. In the residence districts the width is 60 to 66 ft., with a 24-ft. roadway and 18- to 21-ft. parking, the latter including 5-ft. sidewalks 1 ft. back from the property line. The sidewalks and parking have a slope of 6 in. in 20 ft. The paving for the business district will be of brick on a concrete base, while in the residence districts it will be macadam. The alleys are 18 ft. wide.

The sources of water-supply are now being investigated by the engineers. It is planned to put meters on all the services, in order to control the proper use of the water while providing an ample supply.

The sewerage system includes separate storm and sanitary-sewer systems in the business district, and a sanitary system in the residence district. Flush tanks are provided at all the dead ends. The manholes and flush-tanks are of concrete. Sewage purification is essential, the effluent to be discharged into the river, and as there is very little water (sometimes none) in dry seasons, all chance of nuisance must be provided against. Complete purification will be adopted.

All the sanitary sewers are of vitrified pipe, 8 to 15 in. diameter. The sewers are laid in the middle of the streets, with the water mains about 10 ft. from them. An exception to this is at the east end, where the slope of the ground makes it necessary to put the sewers in the alley. Electricity for street and interior lighting will be furnished from the neighboring power plant. This also will supply power for domestic use.

A Third of the Land for Public Purposes

A special feature of the design is the large amount of land reserved for park purposes, this representing 25 to 30 per cent. of the total area. A large public park, called "The Meadows," is laid out along the river and two sections of public gardens in the bottom lands have been reserved for the use of the miners. These are laid out in lots, to be rented by householders, and used for growing vegetables, etc. These garden lots are approximately 100x 100 ft. As the bottom lands are subject to overflow, a dike or levee is being built to protect the lower part of the residence district from flood waters. Rows of trees and shrubs will be planted along the streets.

There will be 10 to 12 miles of streets and water mains, and all streets will be provided with sewers. At present, work is in progress on 7 miles of sewers and an equal length of street grading. No contracts for street paving have been let, but the work of building 200,000 sq.ft. of concrete sidewalk has been commenced by a contractor.

The size of the lots ranges from 30x125 ft. for the miners' houses to 50x125 ft. (or more) in the better residence section. The company will have designs made for dwellings of different styles and costs, and purchasers of lots will be allowed a selection from these. The plans will be drawn to provide for modern conditions of good housing, and sanitation, and all buildings will be erected under the supervision of the company's architect. The company will aid in the erection of the city hall, school, high school, postoffice, public library, hotel, and Y. M. C. A. building. A temporary four-room school has been erected already, for the use of the children of farmers in the vicinity. The railway will build a new station. The first stores and prominent buildings of the business district will be designed and built by the company. A number of residences, three store and office buildings and the railway station are under construction, and occupation of the new city will commence within a short time.

The municipal engineers are Alvord & Burdick, of Chicago, who have designed the street, water and sewerage systems and have supervision of the construction. The architect is George W. Maher, and the landscape architect is O. C. Simonds, both of Chicago. All construction work is being done by the Pawnee Construction Co., whose engineer is W. H. Leland. About $100,000 have been spent this year on municipal improvements.

Planning Methods

The office methods of the engineers in preparing the design of the city were as follows: in the first place, a topographical map was made of the entire area, with 1-ft. contours, to a scale of 1 in. to 100 ft. The streets were then located to fit the topography, and profiles and cross-sections drawn. Then the grades were adopted, together with the widths and forms of cross-section of the streets. Next the sewers were laid out, and sewer profiles drawn. Profiles were then made for the grading, these showing the profiles for the center line and both property lines, with cross-sections for each 100-ft. station. A record map or plat was then made, showing all dimensions. Each lot can be located from $\frac{1}{16}$ corners, which are marked with concrete posts 8 in. square and 4 ft. long, each having a ¾-in. brass plug or bolt in the top, with a crosscut in the center of the head.

Mines and Power Plant under Same Control

Reference has been made to the large power station built recently in the vicinity. This is about a ½ mile from the southeastern corner of the town, being located near the mines and thus assured of a cheap and ready supply of coal for power development. It is designed for an ultimate capacity of 10,000 kw., and will distribute current within a radius of 25 or 30 miles. The plant was designed by Sargent & Lundy, consulting engineers, of Chicago. It is operated by the Central Illinois Public Service Co., which owns a series of power plants and transmission lines.

Discussion By Readers

Results in Discussion

Letter No. 1—Referring to the question of the adoption of some definite plan or policy that would determine conclusively the safest and most successful measures to employ, as suggested in the inquiry, COAL AGE, Nov. 22, p. 786, it is clearly apparent that this is a difficult matter.

The roads to success are many. To bring the discussion of a question to a successful and practical climax is not always an easy matter. Many of the letters written on the subjects discussed in COAL AGE come from men prominent in the mining industry in this country, men of acknowledged ability. Their letters are, in most instances, expressions of actual experience.

It goes without saying that when a practical man has found that a certain method brings good results, he is bound to advocate its adoption, under conditions that appear to be similar to his own. These conditions may or may not be fully explained and understood by all and to this fact may be attributed the success or failure of the plan when adopted by others.

We are often prejudiced in favor of methods with which we have become familiar. To illustrate this point, permit me to give an incident in my own experience. While engaged in my first work in surveying, I was taught to use a tape 300 ft. in length and employ the method of vertical angles for reducing the measurement on the pitch to horizontal distance.

Being employed, later, in another section, I was forced to use a tape only 50 ft. in length. The practice in that locality was to take all measurements on the horizontal. I did not hesitate to condemn this method, but found, after all, that just as accurate results were obtained by the horizontal measurement.

Argument rarely convinces men of prejudiced ideas. The old Scotch adage, "A man convinced against his will is of the same opinion still," aptly applies to a large number of mining men. Every practical mining man, however, will freely admit that the publication of letters relating the experience of others, is of infinite value to the mining industry. By this means, ideas are brought out that would never find expression in print but for this method of discussion. Without a doubt, many of the ideas expressed in the letters are acted upon by others and their merits proved or disproved as the conditions permit. There is always a wrong and a right way to mine coal, but there are many varieties of the right way.

G. M. SHOEMAKER.

Pennington Gap, Va.

Letter No. 2—Mine Superintendent, COAL AGE, Oct. 11, p. 555, and Charter Subscriber, Nov. 22, p. 786, seem to think that COAL AGE or someone should determine the superiority of the proposed methods of safety in mining; and that it should be possible to point out certain definite conclusions in regard to methods that seem to recommend themselves as being superior to all others in handling the dangerous problems that confront mining men today.

I have wondered if the above mentioned parties fully realize the magnitude of the requests they make. To ask for the best plans and methods to be adopted and definite conclusions relative to unsettled questions is one thing; to produce such plans, methods and definite conclusions, under all conditions in mining, is quite another thing. Almost everyone will acknowledge that it is a difficult proposition to lay down plans and methods of safety in mining that will be universal in their application. We all realize that local conditions have much to do in determining the safest methods to pursue. What might be done with a reasonable degree of safety in one mine would, perhaps, be dangerous practice in another mine, although, perhaps, the conditions are almost identical in the two mines.

We may ask: What are the elements that give rise to dangerous conditions in coal mines today; and the answer will be, in most cases, "gas and dust." However, the danger does not consist so much in the presence of gas and dust as in the carelessness, lack of knowledge and discipline of mine officials and the unsafe methods adopted by them, in dealing with these recognized dangers.

The discussions in COAL AGE have resulted in bringing forward many essential points in respect to safety in coal mining, by men of broad experience. It may be true that each writer has written, more or less, from the standpoint of his own experience and with respect to conditions with which he is most familiar. Nevertheless, any reader who has given careful attention to the arguments advanced has surely reached conclusions that will enable him to adopt better and safer methods of mining. It is true that opinions may differ even among men of like experience, but the preponderance of opinion will generally control and point the way to safety.

As a concrete example of this, out of the 19 letters submitted in the discussion of Mixed Lights in Mining, there were but six in favor of the use of mixed lights in mines generating gas, as compared with 13 that were unalterably opposed to the practice. It is reasonable, therefore, to conclude from this discussion that: *In respect to safety, all mines generating gas, in a single section only, should be operated exclusively with an approved type of safety lamp.*

Again, in the discussion on the Effect of the Safety Lamp on the Eyesight, the statement that the continued use of the safety lamp affected the eyesight of the miner and reduced his producing power was not proven to satisfaction, since it was not shown to affect all miners alike. Attention was drawn to this in a brief editorial note, COAL AGE, Oct. 18, p. 585. In the same discussion, it was not shown fully that the use of the safety lamp in mining reduced the producing power of the miner, as was claimed by some. The one argument advanced against the use of the safety lamp, to which all agreed, was its inconvenience in handling.

The eight letters, thus far submitted, discussing the question of Starting a Fan after an Explosion, in a mine, failed to deal specifically with this subject and to make it clear whether or not it is advisable as a means of safety to life and property, to start a fan that has been temporarily disabled by an explosion, before the work of rescue and exploration is undertaken. The failure, in this case, to arrive at a definite conclusion, is probably due to the fact that local conditions have much to do with determining the answer to this question. It must be admitted, however, that the opinion was pretty generally expressed that the condition of the mine workings should be ascertained, in respect to the existence of fires that may have been started in different parts of the mine by the flame of the explosion; and that this knowledge should be obtained by the use of helmets, or other breathing apparatus that would enable rescuers and explorers to enter the mine workings before again starting the fan. A valuable suggestion was also made in several letters to the effect that the work of exploring the mine and restoring the ventilation therein should be performed in sections, which would greatly simplify the task and reduce to a minimum the danger of a second explosion.

The weight of sentiment expressed in the 10 letters submitted in the discussion of Collapsible Stoppings is unquestionably in favor of building substantial stoppings on all main entries and air courses. There have been, thus far, but six letters submitted in the discussion of the Education and Training of Mining Men; but the sentiment expressed in these letters is in accord with that of the editorial, COAL AGE, Oct. 18, p. 585, which makes such education and training *"the recognized cornerstone of all effort for improving conditions in coal mining."* The unanimous verdict in this discussion was that safety in mining will be achieved only in that direction. Since local conditions must largely control and determine the means and methods to be adopted, the greatest responsibility devolves upon the mine foreman, who must use his best judgment in the selection of plans and methods of working. It is this fact that makes it absolutely essential that the mine foreman, more than anyone else, have this education and training.

JOHN ROSE,
Dayton, Tenn. District Mine Inspector.

Collapsible Stoppings

Letter No. 11—I read with much interest the several letters that discussed the question of the practical use of collapsible stoppings to stay an explosive wave in its course through the mine entries by allowing an expansion at the point of origin. I feel that one point, at least, has not been brought out in that discussion and believe that attention should be drawn to that particular point, which applies with equal importance to air bridges or overcasts, as to entry stoppings.

Personally, I believe that all entry stoppings should be built in such a manner as to permit of their being hermetically sealed to prevent any leakage of air, and strong enough to withstand any ordinary shock due to blasting or concussion of the air due to a fall of roof. On the other hand, I do not think entry stoppings should be constructed so strong (if it were possible) as to resist the shattering effects of a violent gas or dust explosion.

Assuming that a small local explosion of gas or dust occurs at some point midway in the mine, the argument is pertinent that the destruction thereby of one or more entry stoppings will not only allow a further expansion of the air and gases of the explosion; but what is of more importance, perhaps, will short-circuit the air current at that point; and, as a result, the gases of the explosion will pass out of the mine by the main return instead of being carried inby and made to traverse the mine workings where many would be suffocated by the afterdamp of the explosion.

The readers of COAL AGE will undoubtedly recall cases in their own experience where the circulation of the air having been destroyed by the displacement or destruction of an overcast, brattice or stopping, the men inby from that point who remained at their places were rescued later when the circulation in the main entries was established. It will be remembered that, in some cases, men who attempted to escape by the main entries were quickly overcome by the afterdamp, at points outby from the explosion.

Such instances were very notable at the Bellevue disaster, Alberta, Canada, Dec., 1910. The stoppings in that mine, which were built of 2x12-in. plank, readily yielded to the pressure of the explosion, thus permitting a rapid expansion of the air and gases, with the result that the concussion was barely perceptible in the inner workings of the mine. In this case, 21 men lost their lives in trying to escape by the main entry, as the afterdamp of the explosion filled both the intake and return airways outby from the point of explosion. The eight men who had retreated to the face of the entry were rescued 10 hr. later.

The mistake of attempting to escape by the main entries, after an explosion in the mine, has been demonstrated repeatedly by the finding of dead bodies scattered along the main entry, at long distances from the working face. In some cases, it has been possible to observe that the victims of the disaster had discovered their mistake too late and attempted to retreat inby, as shown by the footprints in the soft floor.

J. W. POWELL, Sup't.,
Windham, Mont. Cottonwood Coal Co.

Letter No. 12—All stoppings are "collapsible" when considered in reference to the force of an explosion. The Roslyn, Comax or Cumberland, B. C., the Black Diamond or Western Washington, and, in fact, all the coalfields of the Northwest build their stoppings in practically the same manner.

The general method of construction is as follows: Two props are stood, one on each side of the crosscut, close to the rib, and a third prop in the center, in line with the other two. A double thickness of 1x12-in. rough boards is then nailed to the props in a horizontal position to avoid fitting, which would be necessary if one thickness was laid diagonally. The boards, however, are made to break joints; and, to further prevent the leakage of air, the cracks between the boards and the ribs and roof of the crosscuts are caulked with strips of brattice cloth secured by cleats nailed to the boards.

A heavy blownout shot or a few blows of a sledge will knock down these stoppings so that there can be no question but that they are collapsible. In some mines, the room stoppings are made even more flimsy. In many cases but one board is nailed to the top and another to

the bottom of the props, and brattice cloth stretched across them, with long cleats nailed on the two sides close to the ribs of the breakthrough to hold the edges of the cloth.

But few concrete stoppings are built in these fields, and they are seldom more than 4 to 6 in. thick. The mines of the Northwest, however, as a rule, are carefully managed and thoroughly inspected, the British Columbia mining law being particularly strict in this regard; yet explosions have occurred in them. Comax mine No. 6, Cumberland, B. C.; Lawson mine, Black Diamond, Wash.; and No. 4 shaft, Roslyn, Wash., each have had their explosions, and while the stoppings were all blown out, it would be difficult indeed to say that this fact had any appreciable effect on the force of the explosion.

When an explosion traverses a long entry, having rooms turned off every 50 or 60 ft., making available acres and acres of open space for the expansion of the gases of the explosion, and this fact does not arrest its progress, it does not appear reasonable to suppose that the limited area of the airway made available by the blowing down of the stoppings in the entries would have the desired effect even at the initial point of the explosion. The crosscuts between two airways are generally farther apart than the mouths of the rooms turned off the airways; and, even assuming that the entry stoppings were blown out, the entry space thus made available for the expansion of the gases would not be one-hundredth of the space already open to their expansion in the rooms.

The building of so called "collapsible stoppings" in these fields is the general practice; but this is done for reasons of economy and not for the purpose of limiting the force of an explosion, should one occur.

RALPH W. MAYER.

Roslyn, Wash.

[The above rather sweeping description of the method of building stoppings in mines in the Northwest, submitted to the chief inspector of mines, B. C., Canada, brought the following comment in response.—Ed.]

Your correspondent's description of the methods of erecting stoppings in the mines in this region, I believe, must carry him back many years. The system as described by him is still used in crosscuts between stalls or rooms, in a panel district or when building a temporary stopping to carry forward the air in a pair of headings, pending the erection of a more permanent stopping.

There are quite a few mines in British Columbia equipped with modern high-speed fans, delivering from 120,000 to 225,000 cu.ft. of air per minute, against water gages varying from 4 to 5½ in. It would seem practically impossible to obtain these results in a mine where the main stoppings were built in the manner described. You may recall having observed, at the time of your visit to the Crow's Nest Pass Coal Co.'s mines, in 1904, that the type of entry stoppings, in use in those mines was cedar logs flattened to not less than a 12-in. face, the log being set in concrete and faced with the same.

The general principle adopted by the Crow's Nest Pass Coal Co. today is the four-entry system, consisting of a double pair of entries separated by a pillar of coal 150 ft. thick. This central pillar is crosscut only every 100 yd. Eventually, one pair of entries is made the intake and the other pair the return for the mine, which plan greatly reduces the number of stoppings necessary to control the ventilation.

The statement of correspondent that concrete is not used much in building stoppings in the Northwest is wide of the mark. To my knowledge, one mine alone, on Vancouver Island, used in one year, no less than 10,000 sacks of cement in erecting stoppings and overcasts These stoppings varied in thickness according to the area of the crosscut, from 12 to 24 in. In some mines, timber blocks are laid in fine refuse with cement facings; in others, the crosscuts are gobbed tight with refuse, in the usual manner; and the walls thus laid at either end of the crosscut are faced with concrete. My remarks are intended to refer only to the mines in British Columbia.

THOMAS GRAHAM,
Chief Inspector of Mines.

Victoria, B. C., Canada.

Starting a Fan after Explosion

Letter No. 9—Referring to the interesting discussion, a short time ago, in Coal Age, on the question of starting a fan that is assumed to have been disabled by an explosion in the mine, I thought it would be of interest to call attention to one or two incidents where lives were saved by the immediate or continuous operation of the fan.

Because of the varying conditions not only in different coalfields, but in different mines in the same field and often in different seams in the same mine, this is a difficult question to answer directly. To say that the fan, after being repaired, should be started at once in order to restore the circulation in the mine, would not be safe, in all cases. While some mines are free from gas and dust, others are troubled with one or both of these dangers. I have found this true in the Cahaba coalfield, in this state.

I have noticed that some writers treat this subject from a purely theoretical standpoint and others from a wholly practical basis. Most men will agree, however, that the practical knowledge of mining affords the stronger hope of rescue for the unfortunate survivors in the mine. The letters thus far submitted have proved of much value, in showing the different conditions that may exist and in the caution they suggest. In discussing the question, some assume certain conditions that do not exist in all mines, as, for example, that each crossheading has its own separate air split; and conclude that an explosion occurring in one of these headings would not affect the other parts of the mine or would not at least, result in a general explosion.

THE ACTON MINE EXPLOSION

The explosion that occurred at Acton, Ala., Mine No. 2, Nov. 18, illustrates the value of maintaining the circulation in the mine entries, immediately following an explosion, at least under many conditions common in mining. The Acton mine was opened by a slope pitching about 24 deg. and cross-entries had been driven to the right and left of the slope, as far as the ninth level. The mine was ventilated on the split system. The fan was but slightly jarred by the explosion and was soon running again, as usual.

Two rescue parties were organized; and, while one was engaged in restoring the ventilation, the other party was searching the cross-entries and succeeded in bringing

out five men who were found alive. Of the 29 men in the mine at the time of the explosion, the remaining 24 were killed, 16 of these being killed by afterdamp and 8 by the immediate force of the explosion, which was of great violence. The explosion started on the eighth left heading and was caused by a blownout shot. Little gas had been found in the mine, which was considered one of the safest in that district.

This explosion traveled out the slope and destroyed every overcast and stopping along its path. In this case, the split system of ventilation did not save the mine from a general explosion, as some have claimed it would. However, it may be stated that the natural conditions in this mine favored the plan of restoring the ventilation at once, as the coal was hard and would not take fire easily.

Explosion in Another Mine

Another explosion occurred some two years ago, in a mine in the same county, in the Wadsworth seam, which was about 3 ft. thick. This mine also was ventilated on the split system. Undercasts were used instead of overcasts and these were driven through the solid rock, so that the circulation in the splits was not affected by the destruction of the air crossing. The mine was dry and dusty, and previous to the explosion I had watered every heading in the mine. The seam pitched 30 deg. Here, also, the cross-headings were driven off the main slope and rooms turned to the rise of these headings were worked on the chute system.

The immediate cause of this explosion, which started at the face of the fourth heading, was the ignition of a keg of powder that the entryman had left there when charging the holes. In this case also, the flames came out of the heading and traveled up the slope. Fortunately, most of the men were below this heading, and no one was on the slope. In a short time, about 2 min., however, these men began to feel the effects of the afterdamp which would have proved fatal but for the sudden restoration of the air current, due to the action of the fan, which had not stopped. Had the fan stopped, all would have been lost in 10 minutes' time. In my opinion, what saved these men was the fact that all the slope stoppings were built of heavy concrete and brick, and the undercasts, as before stated, were driven through the solid strata.

If this condition existed in other mines, it would often result in the saving of many lives that would otherwise be lost. It is important, also, that the fan be set so that it will not be damaged by the explosion.

Robert Gibson.

Helena, Ala.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

Estimation of Air Columns in Practice—In the ventilation of shaft or slope mines or rise and dip workings in inclined seams, the weight of each respective downcast and upcast column is sometimes calculated separately, by multiplying the weight of 1 cu.ft. of air, at a barometric pressure B and a temperature t equal to the average temperature of the column, by the height or depth D of the same column, as expressed by the formula

$$w = D\,\frac{1.3273\,B}{460 + t}$$

All air columns are of unit cross-section (1 sq.ft.) and the calculated weight of the column, therefore, gives the corresponding pressure in pounds per square foot.

Positive and Negative Air Columns—An air column that acts to assist the circulation in the mine or airway is called a "positive" column; while one that acts to oppose the circulation is turned a "negative" column. In fan ventilation, a negative air column may exist in the downcast shaft by reason of its temperature being greater than that of the upcast, which frequently happens in the summer season.

Conditions—The height or depth D of air column, in any particular case, can only be determined by carefully considering the conditions. It is important to remember that, with few exceptions, the temperature of a downcast-shaft column will closely approximate that of the outer air with which this shaft is constantly filled; while the temperature of the upcast column is practically determined by that of the mine or, in furnace ventilation, by the furnace.

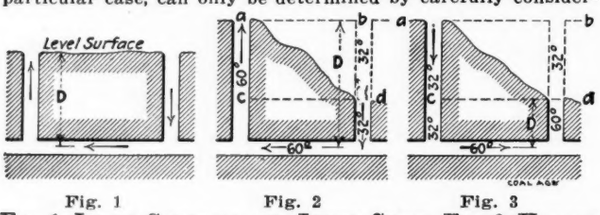


Fig. 1 Fig. 2 Fig. 3

Fig. 1. Level Surface, and Level Seam. Fig. 2. Upcast Deeper than Downcast. Fig. 3. Downcast Deeper than Upcast.

When two shafts, upcast and downcast (Fig. 1), are sunk from a level surface or, in other words, have the same surface elevation it is evident that this level marks the upper limit of both columns.

When, however, the two shafts are sunk on a hillside and have different surface elevations, two cases may arise, as illustrated in Figs. 2 and 3, where, for sake of clearness, the outside temperature is assumed as 32 deg. F. and that of the mine as 60 deg. F.

The Coal Age Pocket Book

The cases are as follows:

1. When the shaft having the higher surface elevation is made the upcast, as is usually done, that elevation marks the upper limit of both shaft columns; because the downcast shaft has practically the same temperature as the outer air.
2. When the shaft having the lower surface elevation is made the upcast this elevation marks the upper limit of both shaft columns; because the air in the other (downcast) shaft above this level is balanced by the corresponding column of outside air.

These two conditions, therefore, are simply expressed by the statement that, in either case, the upper limit of both shaft columns is the surface level of the upcast shaft.

In the same manner it can be shown that the lower limit of both shaft columns is the bottom of the downcast shaft when the seam has a general inclination. Hence, the length (D) of both shaft columns is measured, in any case, from the top of the upcast to the bottom of the downcast shaft. This rule does not apply to slopes.

Ventilating Pressure and Shaft Columns—Since the weight of an air column, in pounds, expresses the corresponding pressure, in pounds per square foot; and since ventilating pressure (lb. per sq.ft.) is the difference of pressure between the intake and return; the ventilating pressure, in any given case, is found by subtracting the weight of the upcast-shaft column from that of the downcast column; thus,

Downcast-shaft column, $w_d = \dfrac{1.3273\,B}{460 + t}\,D$

Upcast-shaft column, $w_u = \dfrac{1.3273\,B}{460 + T}\,D$

$$p = 1.3273\,B\left(\frac{1}{460 + t} - \frac{1}{460 + T}\right)D$$

which can be written

$$p = \frac{1.3273\,B\,(T - t)\,D}{(460 + T)(460 + t)}$$

Calculation of Air Column—The air column corresponding to the above unit ventilating pressure can be expressed in terms of either the downcast or upcast air. The air in the downcast being heavier than that in the upcast, gives a shorter air column for the same pressure.

To find the air column (h_d) in terms of the **downcast air,** divide the above expression for unit ventilating pressure by the weight (w) of 1 cu.ft. of downcast air (temp. = t), which gives

$$h_d = \frac{p}{w} = \frac{(T - t)\,D}{460 + T}$$

To find the corresponding air column in terms of the **upcast air,** divide the same expression for unit ventilating pressure by the weight of 1 cu.ft. of upcast air (temp. = T), which gives

$$h_u = \frac{p}{w} = \frac{(T - t)\,D}{460 + t}$$

Inquiries of General Interest

Organic Sulphur in Coal

I have a question that relates to the analytical chemistry of coal; and, while I know that it is not a simple determination and one that is not often called for, I would like to ask for such information as some of the readers of COAL AGE may be able to give from their experience or knowledge of the subject. I refer to the determination of the organic sulphur that may be contained in coal.

J. V. FREEMAN, Chief Chemist,
Central Laboratory.

Joliet, Ill.

The most common occurrence of sulphur in coal is in the form of pyrites. This occurs either as nodular masses scattered in the coal, or as thin partings interlaminated with the coal, or as finely divided particles disseminated in the mass. What is known as "organic sulphur" is that form in which the sulphur in the coal is combined with carbon or carbon and hydrogen.

In reference to the determination of the organic sulphur in coal, if any of our readers know of a practical method that will separate and determine the sulphur associated in this form, we shall be glad to publish the same.

In this connection, we would draw attention to the editorial that appeared recently in COAL AGE, Aug. 23, 1913, p. 273, relating to the presence of sulphur in the original ingredients that entered into the composition of the coal, and certain erroneous speculations in reference thereto. Also, the short article entitled, Why Sulphur is Found in Coal, Jan. 4, 1913, p. 15.

Rope Lubrication

Can COAL AGE readers give the records or results of scientific investigation or those obtained practically by a reliable party or company, relative to the lubrication of both hoisting and haulage ropes, under wet and dry conditions, in mining practice? This is a question of the greatest practical importance in coal-mining economy and one that deserves attention. What is the best dope and its method of application, and what results have been obtained by its use, in the prolongation of the life of the rope?

A. H. POLLINS, Supt.,
H. C. Frick Coke Co.

Southwest, Penn.

Steel-wire hoisting ropes should be treated periodically with boiled oil (linseed), which is commonly applied by allowing the hoisting rope to run slowly through a wad or bundle of waste on which the oil is poured in quantity sufficient for the thorough lubrication of the rope. This process is repeated at regular intervals, from time to time, as often as the conditions may require. The frequency of the lubrication can only be determined by closely observing the condition of the rope.

In wet shafts, especially where the water has a corrosive action, some standard preparation of crude petroleum and graphite can be used to advantage. Many lubricating firms furnish a good weather-proof graphite grease that gives excellent results.

Haulage ropes require for their protection a dope of greater substance, as, for example, a mixture of pine tar with, say one-tenth raw oil. This mixture is boiled together at a low heat and applied warm. Care is required not to burn the tar, which would destroy its protective quality. It is also important to ascertain that the tar contains no acid; or, if it does, to neutralize it by the addition of slaked lime to the tar. It is recommended that a peck of lime should be used to one barrel of tar, for this purpose. We should be glad to receive figures showing the effect of lubrication to prolong the life of ropes used in hoisting and haulage, in mining practice.

The Mining Expert

I have noticed, in reading various articles, that some writers style themselves "Coal Expert." As I have not a clear understanding of the full meaning that attaches to this title, I would like to ask what education, experience or capability qualifies one for such characterization.

I. S. C.

Indianapolis, Ind.

The term "expert" has been applied by courts to special witnesses supposed to be capable of giving valuable testimony in relation to the technical or industrial details of questions before the court. The person thus designated is assumed to have a knowledge and experience that fits him to speak with authority on the questions concerning which he is called.

Among reputable engineers, the term "expert" has largely fallen into disrepute, owing to its misuse by men of little or no engineering knowledge or experience; but who assume to have a more or less intimate acquaintance with the conditions involved and to be competent judges of matters in question. The self-styled expert generally has no other stock in trade than the title he appends to his name.

Nothwithstanding the stigma that is thus associated with the term, the true mining expert has a standing that gives weight to his conclusions both in court and in consulting engineering practice. This, of course, is dependent on and determined by his reputation as an engineer. All engineers are not experts, just as all so called experts are not engineers, or even good practical men of sufficient experience to warrant the use of the term.

The essential qualities involved in the rightful use of the word or title, are a thorough and complete technical knowledge, the practical application of which has been taught by a long and varied experience in the field, mine, shop, or laboratory; and, even this dual qualification must be cemented by a sound judgment that commands respect and confidence.

Examination Questions

Miscellaneous Questions

(*Selected Questions*)

Ques.—What is the pressure per square inch in a boiler when the entire length of the lever is 32 in.; the distance between the fulcrum and valve stem being 4 in. and the diameter of the valve 2½ in., if a weight of 30⅝ lb. is hung at the end of the lever?

Ans.—The question is assumed to refer to the lever of a safety valve of a boiler, although this is not stated; neither are the weight of the lever, valve and valve stem and the center gravity of the same mentioned; though they are important for the correct solution of the question. However, neglecting the weight of the lever, valve and valve stem, the solution is as follows: According to the principle of moments, the moment of the weight at the end of the lever is equal to the moment of the entire pressure exerted on the valve through the valve stem. Calling this total pressure P, we have

$$P \times 4 = 30\tfrac{5}{8} \times 32 = 980$$

$$P = 980 \div 4 = 245 \text{ } lb.$$

The sectional area of a 2½-in. valve is $0.7854 \times 2.5^2 = 4.9$ sq.in. The unit pressure on the valve is then

$$p = 245 \div 4.9 = 50 \text{ } lb. \text{ } per \text{ } sq.in.$$

Ques.—What thickness of pillar would you leave around the bottom of a shaft 450 ft. deep, the coal being 7 ft. thick and underlaid with 4 ft. of fireclay; above the coal is 10 ft. of soapstone, the balance of the cover being shale, sandstone, clay and soil?

Ans.—Owing to the fireclay floor and the soft soapstone roof of this seam, the safest rule to adopt is that known as Hughes rule for the least diameter of circular pillar or side of a square pillar. This rule allows 1 yd. in pillar thickness for each yard of depth, which makes the minimum diameter of a circular pillar or the minimum side of a square pillar, 450 ft.

Ques.—The indicated horsepower of a pumping engine, raising 1000 gal. of water per min. 500 ft., in a vertical shaft, is 200 hp.; what is the efficiency of the pump?

Ans.—Since no data are given for calculating the friction of the pipe line, in this case, it is only possible to estimate the efficiency of the system, including both the pump and the pipe-line resistances. Estimating the weight of the water as 12 gal. per 100 lb., the total weight of water pumped per minute is $1000 \times 100 \div 12 = 8333+$ lb. The foot-pounds of effective work performed is then $8333 \times 500 = 4{,}166{,}666+$ ft.-lb. per min. The indicated work is $200 \times 33{,}000 = 6{,}600{,}000$ ft.-lb. per min. The efficiency of the system is then

$$\frac{4{,}166{,}666 \times 100}{6{,}600{,}000} = 63.13 \text{ } per \text{ } cent.$$

Ques.—What percentage of marsh gas in the air makes itself apparent in the safety lamp?

Ans.—The answer to this question depends wholly on the kind of lamp used, the oil burned, the ability of the observer to detect the flame cap and the presence or absence of other gases in the mine air. While the presence of fine coal dust floating in the air or a small percentage of carbon monoxide, assists the formation of the flame cap and makes it visible for a less percentage of marsh gas, the presence of carbon dioxide or a depletion of the oxygen of the air retards the formation of the flame cap. Assuming, however, a pure air and using an unbonneted Davy lamp burning a good quality of sperm, lard, or cottonseed oil, a good fireboss can usually detect about 2 per cent. of marsh gas on the flame of his lamp.

Ques.—Find the breaking strain of a ⅞-in. six-strand, 19-wire, crucible-steel hoisting rope; also the safe working load of this rope.

Ans.—The breaking strain of a 1-in. crucible-steel, six-strand, 19-wire hoisting rope being 39 tons, and the strength of the rope being proportional to the square of the diameter, the breaking strain of a ⅞-in. rope of the same kind is

$$L = 39 \text{ } d^2 = 39 \text{ } (⅞)^2 = 29.86, \text{ } say \text{ } 30 \text{ } tons.$$

In ordinary hoisting practice, for moderately deep shafts, it is customary to use a factor of safety of 5, which makes the safe working load, in this case, $30 \div 5 = 6$ tons.

Ques.—If 20,000 cu.ft. of air is circulated in a mine, under a 1-in. water gage, what water gage will be required to circulate 60,000 cu.ft. per min. in the same mine under the same conditions?

Ans.—For the same conditions in the airway, the pressure or water gage varies as the square of the quantity of air in circulation. In other words, the water-gage ratio is equal to the square of the quantity ratio, which gives, in this case,

$$\frac{x}{1} = \left(\frac{60{,}000}{20{,}000}\right)^2 = 3^2 = 9$$

$$x = 1 \times 9 = 9 \text{ } in.$$

Ques.—If it is desired to double the quantity of air in a mine or airway, how much must the ventilating pressure be increased?

Ans.—For the same mine or airway, the ventilating pressure varies as the square of the quantity. Then, to double the quantity, the ventilating pressure must be increased $2^2 = 4$ times.

Ques.—If a 40-hp. fan gives 120,000 cu.ft. of air per minute, what quantity of air will a fan of 32 hp. give?

Ans.—For the same conditions in the airway and assuming the efficiency of the fan is the same in each case, the quantity of air in circulation varies with the cube root of the power; or, in other words, the quantity ratio is equal to the cube root of the power ratio. Hence, calling the required quantity x,

$$\frac{x}{120{,}000} = \sqrt[3]{\frac{32}{40}} = \sqrt[3]{\frac{4}{5}} = \sqrt[3]{0.8} = 0.9283$$

$$x = 120{,}000 \times 0.9283 = 111{,}400 \text{ } cu.ft. \text{ } per \text{ } min.$$

Coal and Coke News

Washington, D. C.

A final decision in the important case of the Wisconsin Coal Co. vs. The Pere Marquette R.R. Co., and in several other cases grouped together under the same heading, has been handed down by the Interstate Commerce Commission, and is now just made public.

In this case it was contended by the complainants that they were entitled to free reconsignment of coal at Milwaukee, and asked reparation on account of damage suffered as the result of alleged unjustifiable holding of cars at Ludington, including reconsignment and demurrage charges paid on cars detained, as well as damages. The complaint also embraced a charge of discrimination and alleged that the new tariff effective last February was unreasonable. The commission now holds that the complainants were not entitled to free reconsignment at Milwaukee, but were entitled to such reconsignment at a charge of $2 per car. It is held that the detention of cars at Ludington was unjustifiable, and that demurrage charges were improperly assessed and must be refunded. With respect to cars which arrived at Ludington before the receipt of passing notice and proper time for giving disposition orders, the charges were improperly assessed and should be refunded.

Reconsignment Involving Extra Service Must Be Paid For

There is no evidence upon which to measure damage to cars upon which the notice was insufficient. Generally speaking, it is held that the commission has power in its discretion to require the establishment of reconsignment and diversion on the basis of the through rate from the point of origin to new destination with a fair charge for extra sevice. Further, it is held that a carrier may, as a matter of convenience when its terminal tracks are congested, hold cars at some point short of destination, provided that such a course involves no disadvantage to the public. There are several other interesting points in the case that cannot be briefly treated.

The case in question grew out of a controversy concerning the service of reconsignment to be afforded bituminous coal shipped by the complainants to Milwaukee and diverted to destinations beyond. The complainants were coal brokers at Milwaukee. They had no storage facilities. Their practice is to ship coal from the mines in Ohio, Pennsylvania, and West Virginia to Milwaukee under what is known as a "blind billing." The destination given is, for example, "Milwaukee, or beyond," or "Elm Grove," the latter being a station a short distance outside of Milwaukee on the line of the Chicago, Milwaukee & St. Paul.

Reconsignment Is Due to Carriers' Own Default

Some of this coal is ordered and sold by the complainants under contract. The larger portion of it, however, is "free coal," and is sold during transit. In the case of the free coal, reconsignment during transit is, of course, the practice. It is alleged by the complaints that reconsignment is further required because the unusual delays in the movement and carrier's failure to deliver coal in the order in which it is shipped from the mines makes it necessary for the coal brokers to supply their contract and order demands from time to time with substitutions of free coal.

The coal moves to Milwaukee on a proportional rate. Coal actually delivered in Milwaukee for local consumption paid, at the time of the complaint, from the Kanawha fields a rate of $2.50 a ton. Coal going through Milwaukee for delivery to destinations beyond was charged a proportional rate of $1.90 per ton. This rate has since been increased to $2 per ton. Beyond Milwaukee it pays the full local rates of the delivering carriers. The defendant, the Pere Marquette R.R., has engaged extensively in this transportation. It receives the coal from Eastern carriers at Toledo, Ohio, and moves it thence to Ludington, Mich., a distance of about 273 miles. From Ludington the traffic is carried on the Pere Marquette's car ferries across Lake Michigan, a distance of 97 miles to Milwaukee, where the Pere Marquette makes connection with the Chicago, Milwaukee & St. Paul. It is also ferried to Manitowoc, Wis., where connection is made with the Chicago & North Western and the Soo Line.

At Milwaukee, the Pere Marquette has no extensive terminal, but only an interchange track connecting the car ferry with the tracks of the Chicago, Milwaukee & St. Paul road. This track accommodates about 200 cars. The Pere Marquette maintains no motive power in Milwaukee, and the service of switching the cars from the car ferries to the interchange track and subsequently, in the case of outbound movements, to the tracks of the St. Paul road is done by the locomotives and employees of the latter road under a contract for this service with the Pere Marquette.

Reconsignment Must Precede Arrival of Cars at Reasonable Distance from First Destination

In speaking of one of the main points at issue, the commission makes another interesting ruling and says:

We . . . held that it would be unreasonable and an unjust burden on traffic for carriers to exact the reconsigning charge without undertaking the duty of giving notice to consignees, thus affording them an opportunity of giving disposition orders before the arrival of the cars at their destination. We stated on the other hand that if the coal dealers, having such notice, were not able to give their reconsigning orders before the cars reached Detroit, it was entirely just and reasonable that they should pay the charge for the reconsignment service. We believe that this rule properly may be applied in the present case."

The Railroads are Asked to Show Whether Coal Rates Are Reasonable

Request has been made of the Interstate Commerce Commission by counsel for the Pittsburg Coal Co. that it shall require of all railroads involved in the advanced-rate cases a definite statement of the actual cost of transportation of coal (bituminous) from mine to point of delivery, differentiating the different elements of cost, such as haulage charges, terminal expense, etc. It has not yet been definitely decided how far the commission will require carriers to go in this matter, as it is recognized that an attempt to provide, in good faith, the data mentioned by the Pittsburg Coal Co. would involve a large statistical expense. Carriers regard the matter with some anxiety, believing that the granting of the request would establish a serious precedent. Besides the request demands of them data which they hardly believe they can secure with exactitude.

HARRISBURG, PENN.

A strike of all the miners in the bituminous District No. 2 on April 1, or the shutting down of all the mines by the operators, or both, may be the outcome of a meeting held on Jan. 9, of the Association of Bituminous Coal Operators of Central Penn.

The subject of dissolving the association was thoroughly discussed.

This was advocated by many members because of the alleged unfairness of the miners in reference to the agreement between the operators and the men which expires on Mar. 31. However, it was decided finally not to disband.

On the other hand, it is understood that, a change will be made in existing wage rates and the operators, it is said will ask the men to submit to a reduction of wages. Such a step undoubtedly would lead to a strike or a total suspension.

During the last year the proceeds have fallen off considerably in this district, due to the numerous petty strikes, which the operators assert were based almost wholly on the "closed shop" proposition and were in violation of the existing contract.

Many members of the association allege it is useless to make a contract with a labor organization that violates it at its convenience and with apparently no officials with power to enforce the terms of the contract. When the motion for dissolution was finally put up to the executive board, six of the members voted to disband and seven members voted to continue.

It is alleged that the mine workers are scheming to circumvent the clause in the existing agreement that provides there shall be no cessation of work for 30 days, pending a failure to reach an agreement.

It is reported a call has been issued for a convention of the mine workers delegates from all locals of District 2 to be held on Feb. 24 fully a month earlier than has been the custom. It is also alleged that the miners are forcing a meeting of the Scale Committee of both sides late in February, so that 30 days shall have expired by midnight Mch. 31, the date when the existing scale goes out.

PENNSYLVANIA

Anthracite

Wilkes-Barre—One of the most important lawsuits to be tried in years, and which is expected to determine for the first time the rights and liabilities of a coal company to mine under public streets, was called before Judge O'Boyle on Jan. 8. It is the equity suit filed by Plymouth Borough against the Plymouth Coal Co., to restrain the latter from mining coal under the borough streets.

This is said to be the first case of its kind to be tried in the anthracite region and the result will have considerable bearing on the mine cave question and the rights of municipalities as against the mining rights of the coal companies and their liability for surface support.

Harrisburg—Charters issued by Secretary of State McAfee, on Dec. 31, for the incorporation of eleven electric companies, to operate in Bucks County are thought to be a forerunner of an important plant which may eventually supply light, heat and power to the city of Philadelphia. The incorporators of the new company are S. D. Warriner, president of the Lehigh Coal & Navigation Co., Rollin H. Wilbur, S. Davids, and P. F. Baker, Germantown.

A few years ago the Lehigh Coal & Navigation Co. began the construction of an electric plant at Hauto in Carbon County, and the fuel is obtained from culm banks controlled by the company. With this advantage over competitors in not having to purchase fuel, the company can manufacture and dispose of electricity at cheaper rates than other companies.

Bituminous

Uniontown — Two large acreages of the Freeport vein of coal in West Virginia were purchased by J. O. Clark. The coal purchased is in two tracts of 510 acres, one being of 245 acres and the other of 265 acres. The coal was purchased from D. E. Runnion, of Strange Creek, W. Va. The tracts are located on Elk River and Birch River, and are near the tracts owned by the Colonial Coal Co., the Farmers' Coal Co., and the Strange Creek Coal and Coke Co., all owned by Uniontown capitalists.

Charleroi — River shipping coal mines in the Monongahela Valley are threatened with forced suspension by the strike of tow boat engineers. All but three towboats have stopped operations. This means that no coal can be shipped by river and as soon as the barges at the different mines are filled the mines will have to stop work until the strike is settled or the boats start to operate.

WEST VIRGINIA

Moundsville—Four men were burned in an explosion of gas which occurred in room 12 of the First St. mine of the Mound Coal Co. on Jan. 9. None of the men was seriously injured. The accident was the result of a pocket of gas accumulating and becoming ignited. The four men who were burned were working in the room at the time the explosion occurred. Between 75 and 150 men are employed in the mine. The explosion was confined entirely to room 12 and caused very little damage to the mine.

TENNESSEE

Knoxville — The Knoxville Iron Co. has sold its Cross Mountain coal mine, near Briceville, to the Cross Mountain Coal Co., which has been organized with a capital stock of $200,000. The price given for the property has not been announced. It is understood that the two companies are in no way connected. The mine involved is that at which the disaster occurred two years ago, resulting in the death of 80 miners.

Chattanooga—It is said that plans are on foot for the amicable settlement of the litigation in which the Dayton Coal & Iron Co. became involved some time ago following the suicide of Peter Donaldson, principal owner, in Scotland. The receivership will be wound up and the company may be reorganized and put on its feet again.

KENTUCKY

Louisville—Formal announcement was made in Louisville last week of the acquisition and merger by the Pittsburgh Coal Co. of six concerns which have handled Pittsburgh coal for a number of years. The consolidation was practically consummated about six months ago, but several details were not completed until recently. The companies included in the merger are Joseph Walton & Co., the O'Neill Coal & Coke Co., O'Donnell & Co., Rabb & Bohmer, Eclipse Coal Co. and the Camden Coal Co. The offices of the company are to be maintained at 121 South Third Street, where Joseph Walton & Co. have done business for a number of years.

Middlesboro—The construction of an electric railway line to connect Middlesboro and Pineville, eastern Kentucky coal centers, as well as a city railway line for Middlesboro, is again being projected, and definite plans may be formed by spring. Mayor J. L. Manring, of Middlesboro, is much interested.

OHIO

Zanesville—The property of the Saltillo Coal Co., consisting of three separate tracts of land and mining rights, was sold at trusetts' sale in Zanesville to attorney E. F. O'Neal for $17,000. It includes a tract located near Cannellville in Muskingum County which is in operation, a tract near Saltillo in Perry County and a tract near Rehoboth in Perry County. A company will be organized to operate the property.

Columbus — A movement for the regulation of coal mines in Ohio, as recommended by the Ohio Mining Commission in its report to Governor Cox, has recently received support from many sides. It is the first attempt on the part of the state government to regulate private enterprises. Coal mines when owned by individuals or corporations have always been classed as private property. The claim is made that when the private enterprise takes on a public interest that overshadows its private rights, the state has the right to say how it may be handled. Lawyers are interested in the proposed measure and the legal problems it will bring with it.

INDIANA

Terre Haute — The executive board of the Indiana Coal Operators Association has adopted a resolution asking the Interstate Commerce Commission to grant a 5 per cent. increase in freight rates asked by the railroads. The resolution calls attention to the advances in wages and other increased costs of operating the roads.

Indianapolis — The Supreme Court of Indiana affirms a judgment of the Greene County Circuit Court for $8000 damages against the Shirley Hill Coal Co. for causing the death of Frank Miller, by failing to keep the roof of a mine in safe condition. The company's appeal was on the ground that the verdict was excessive.

ILLINOIS

Harrisburg—The City Council recently passed an ordinance that no liquor shall be delivered by the express companies, unless the purchaser shall sign an affidavit that the liquor is to be used for medical purposes, and any person who invites a friend to his home or place of business and gives him a drink, is subject to a heavy fine. All clubs are prohibited from keeping liquors in their rooms. Harrisburg is a dry town and is the center of some seventeen or eighteen mines, which produce practically all of the coal in Saline County.

MISSOURI

St. Louis—A general protest has been made by Kansas City business men against an enforcement of the ouster order, recently rendered against lumber companies operating in Missouri, including the Central Coal & Coke Co. Commercial organizations of Kansas City are planning to enter a formal request for a withdrawal of this feature of the decision. If the ouster is enforced, 1075 miners employed in Missouri by the Central Coal & Coke Company will be thrown out of employment. The operating company, would, of course, have the alternative of selling its mining property, or inducing another company to operate it.

OKLAHOMA

McAlester—An explosion occurred in Mine No. 40 of the Rock Island Coal Co. at Gowen on Jan. 2, killing John Cronis, shot-firer. Another shot-firer in another part of the mine escaped unhurt and was rescued the next day by the party which found Cronis' body. The company will sustain heavy financial loss by reason of the explosion, and 300 miners will be out of employment until repairs can be made.

COLORADO

Cañon City—Arrangements have been completed whereby the convicts at the state penitentiary will mine coal to be used at that institution and at the Buena Vista asylum. This step was taken because the coal companies have been unable to furnish the necessary fuel. Gov. Ammons was one of the parties to the agreement whereby the prisoners will work mine No. 5 near here.

Trinidad—Miners who left the district when the strike was called on Sept. 23 are returning to work in southern Colorado in large numbers, according to reports recently received.

NORTH DAKOTA

Shields—A big lignite coal mine will be opened on the Standing Rock Indian reservation, a few miles south of here, next spring. The district in question is underlaid with a splendid quality of lignite, and the opening of the mine (for which the financial features have been arranged) will give employment to a large number. It is proposed by the operators to give employment particularly to the Indians.

WASHINGTON

Spokane—The Oregon - Washington R.R. & Navigation Co. has announced a voluntary reduction of 45c. a ton on coal from the Wyoming field to Spokane and vicinity, effective immediately, to meet competition from the northern Wyoming field, where rates were ordered reduced by the Interstate Commerce Commission. The rate is reduced to $4 a ton. In addition the railroad will, commencing February, switch coal t industries on other lines in Spokane without switching charge.

RECENT COAL AND COKE PATENTS

Coal Separator. G. H. Elmore, Joplin, Mo. 1,077,876, Nov. 4, 1913. Filed July 7, 1905. Serial No. 268,647.

Stoker. P. L. Crowe, Jersey City, N. J. 1,077,872, Nov. 4, 1913. Filed Oct. 1, 1907. Serial No. 395,466.

Coke Quenching and Conveying Apparatus. A. Brunner and W. Schondeling, Leipzig-Gohlis, Germany. 1,077,255, Nov. 4, 1913. Filed Apr. 30, 1910. Serial No. 558,592.

Furnace. A. O. Gutsch, Sheboygan, Wis. 1,077,405, Nov. 4, 1913. Filed Nov. 18, 1912. Serial No. 732,106.

Gas Producer. W. O. Amsler, Pittsburgh, Penn. 1,077,578, Nov. 4, 1913. Filed Mar. 14, 1910. Serial No. 549,168.

Mining Machine. E. McGowan, Mulberry, Kan. 1,077,419, Nov. 4, 1913. Filed June 14, 1912. Serial No. 703,683.

Bit for Mining Machines. J. J. Moore, Springfield, Ill. 1,077,542, Nov. 4, 1913. Filed Apr. 15, 1912. Serial No. 690,793.

Mechanical Stoker. W. P. Starkey, Harrisburg, Penn. 1,077,494, Nov. 4, 1913. Filed Nov. 19, 1908. Serial No. 463,488.

Steam Superheater for Locomotive and other Smoke Tube Boilers. J. G. Robinson, Manchester, Eng. 1,077,641, Nov. 4, 1913. Filed July 26, 1912. Serial No. 711,681.

Mine Shot Firing System. G. I. Rawson, St. Louis, Mo. 1,078,463, Nov. 11, 1913. Filed May 4, 1909. Serial No. 493,792.

Boiler. T. T. Parker, New York, N. Y. 1,078,252, Nov. 11, 1913. Filed May 28, 1913. Serial No. 770,394.

Mine Shovel. J. C. Cartmill, Lead, S. D. 1,078,255, Nov. 11, 1913. Filed Oct. 5, 1912. Serial No. 724,141.

Apparatus for Regulating Supply of Steam to Gas Producers. C. H. T. Alston and P. T. Houston, London, Eng. 1,078,480, Nov. 11, 1913. Filed June 28, 1913. Serial No. 776,414.

Cutting Bit for Chains of Mining Machines. C. N. Barton, Harrisburg, Ill. 1,078,082, Nov. 11, 1913. Filed Feb. 10, 1913. Serial No. 747,397.

Grate. G. M. S. Tait, Washington, D. C. 1,078,071, Nov. 11, 1913. Filed Nov. 4, 1912. Serial No. 729,482.

Water Seal for Gas Producers Working with High Pressure Blast. A. von Kerpely, Vienna, Austria-Hungary. 1,078,148, Nov. 11, 1913. Filed Dec. 21, 1912. Serial No. 737,974.

Coal Breaker. W. Lloyd, Drifton, Penn. 1,079,301, Nov. 18, 1913. Filed May 27, 1913. Serial No. 770,270.

Boxing for Coal Drilling Machines. A. F. Derwy, Pittsburg, Kan. 1,079,289, Nov. 18, 1913. Filed Jan. 4, 1912. Serial No. 669,501.

Coke Drawing Apparatus. J. Hayes, Uniontown, Penn. 1,079,126, Nov. 18,1913. Filed June 18, 1913. Serial No. 774,456.

PERSONALS

J. C. Law, of Carbondale, Penn., was in New York Thursday of last week on a short business trip.

Frank Clark, who has been mine superintendent for the Piney Mining Co. for the past several years, has accepted a position at one of the operations of the Raleigh Coal Co.

E. W. Luton, of Columbus, Ohio, who is well known in coal circles in Indianapolis, has taken the position of Indiana representative for the New York Coal Co., of Columbus, in the place of Arch Grossman, resigned.

W. J. Brown, outside foreman at the Phœnix Park Colliery, has been appointed superintendent of the Philadelphia & Reading Coal & Iron Co.'s collieries in the Ashland district, to succeed W. A. Sauerbrey, resigned.

A. Vernon Orner, civil and mining engineer, recently with the firm of Hess and Bouton of Dubois, Penn., has been appointed chief engineer and superintendent of the Panther Run Coal Co. at Pardus, Jefferson County, Penn., succeeding Henry Redding the retiring superintendent. Mr. Redding has been with the Panther Run Coal Co. for the past 11 years and expects to retire from active business, while Mr. Orner is probably the youngest superintendent employed by any coal company.

OBITUARY

Stephen Harris Harrington, president of the Harrington & King Perforating Co., Chicago, Ill., died recently.

Grant J. Hamilton, 59 years old, a coal operator of Argentine, Penn., died at his home there on Jan. 6. Mr. Hamilton was general superintendent of the Standard Coal & Mining Co. and superintendent of the Mutual Coal Co.

Chas. Campbell, age 67, recently died at his home at White Gables, Kansas City. He was prominent in commercial and financial circles in Kansas City, and was President and Chairman of the Board of Directors of the Central Coal & Coke Co. He began his career at the age of 15 years, as a grocer clerk at Iowa City, Iowa, and died a millionaire.

E. E. Shumway, President of the Rocky Mountain Fuel Co., and well known financially throughout the West, died, Jan. 11, at his home. Mr. Shumway became ill after having superintended the removal of the bodies of 37 men from the Vulcan Mine at New Castle, after an explosion, Dec. 17. The coal strike also is said to have impaired his health. Mr. Shumway, who was 51 years old, is survived by a widow, two daughters, a son, and two stepsons.

Bernard Corrigan, president of the Kansas City Midland Coal & Mining Co., operating mines at Novinger, Mo., died in Kansas City on Jan. 6 of heart disease. Mr. Corrigan was 66 years old. He was the leading figure in the operations of the mining company, of which he was head, but held many other offices during his career. He was for nine years president of the Metropolitan Street Railway Co., of Kansas City, resigning in 1910. Several sons are connected with the Kansas City Midland Coal & Mining Co., and one of them probably will be made president. Mr. Corrigan's estate was worth something over a million dollars, being smaller than expected.

CONSTRUCTION NEWS

Birmingham, Ala.—The Woodward Iron Co. announces that it will start work immediately upon the construction of 30 modern byproduct coke ovens.

Ellwood City, Penn.—The National Coal & Ice Co. has let the contract for a steel coal tipple to the Niles Forge Co.; work will be started in the near future.

Lima, Ohio—The 300-ton coal dock for the Lake Erie & Western Ry. at Lima, Ohio, has been completed by the Oval Construction Co. of Chicago and turned over to the railway company.

Waynesburg, Penn.—The Pennsylvania Railroad will soon make an extension of its lines to tap the new coalfield recently acquired by the Youngstown Sheet & Tube Co. in Greene County.

Brownsville, Penn.—The Denbeau Coke Co. is planning to construct 64 additional coke ovens at its mine near here. The company has 236 ovens, and the addition will bring the number up to 300, all of which are of the most modern type.

Canton, Ohio—The American Mine Door Co. has just fininshed shipping an order for 53 machines to the Clinchfield Coal Corp., for their Dante and Dumps Creek operations. It also filled the last of an order for 75 machines last week for the Illinois mines of the Madison Coal Corp., St. Louis Mo.

Columbus, Ohio—The announcement is made from lake ports that 15 steel freighters are being constructed during the winter months to be placed in coal trade at the opening of navigation in 1914. A number of these boats are to take the place of boats destroyed in the severe storms of last November.

Artemus, Ky.—The recently organized Cumberland R.R. Co. is pushing its plans for the construction of a line of railroad from Wheeler, Ky., to Jellico, Tenn., a distance of 24 miles through a rich coal-mining country. The offices of the company are located for the present at Artemus, Ky., in charge of T. H. Hayden, general manager.

Hebron, N. D.—Plans will be made in a few days for the reconstruction of the state experimental lignite briquetting plant, which was recently destroyed by fire. Dean E. J. Babcock, of the School of Mines, who has charge of this plant, is not certain just when the task will be completed, but he anticipates the success of the movement within a short time.

NEW INCORPORATIONS

Chicago, Ill.—The Chicago & Harrisburg Coal Co., of Harrisburg has increased its capital stock from $55,000 to $1,000,000.

Springfield, Ohio—The Springfield Ice & Coal Co., of Springfield, Ohio, has filed papers with the Secretary of State, increasing its capital stock from $122,000 to $250,000.

Richmond, Va.—The Felton Coal Co. has been incorporated at Tacoma, Va., with a capital stock of $10,000. M. F. Hatfield is president and G. F. Neal secretary, both of Tacoma, Va.

Dover, Del.—Elijah & Winne, recently incorporated at Dover, Del., with a capital stock of $25,000 to manufacture and deal in anthracite and bituminous coal and its products.

Mayland, Tenn.—The Mayland Coal & Coke Co. has been incorporated with a capital stock of $50,000. J. S. Cline, C. H. Sells, T. F. Brown and others are among the incorporators.

Chattanooga, Tenn.—The Kentucky Coal & Iron Co. has filed articles of incorporation. The company will operate coal mines and will probably establish iron furnaces near Chattanooga.

Brazil, Ind.—The Peacock Coal Co. has been organized by Mayor John Bray, and will at once locate a shaft on Bray's farm near Billtown where there is a bed of bituminous coal 6 ft. 8 in. thick.

Indianapolis, Ind.—The Cedar Creek Coal Co. has been incorporated here, with $10,000 capital stock, to deal in coal and coke. The directors are A. V. Grossman, H. Grossman and C. P. Bartlett.

Wellston, Ohio—The Blue Jay Coal Co., of Wellston, Ohio, has been incorporated with a capital stock of $10,000 to mine and deal in coal. The incorporators are W. S. McCloud, H. A. Goddars, Grant McGhoe, John H. Yeager, and C. E. Littler.

Poteau, Okla.—The Claco Mining Co., with a capital of $50,000 has been organized by J. T. Roland and Hugh Dook of Milton, L. S. Bayrell, of Frederick, F. L. Mercer and C. G. Weise, of Poteau and Ed Hayes, of Witteville. The company will open an entirely new coal field at Traby Prairie, near here.

Indiana, Penn.—The Conemaugh Smokeless Coal Co. has been organized and will develop 2000 acres of coal in Indiana County, near the Westmoreland County line. The coal is owned by the Operators' Coal Co. This company has big holdings in Indiana County, having recently acquired 1700 acres. It now owns 4500 acres in the Indiana field.

INDUSTRIAL NEWS

Woodlawn, Penn.—Fire destroyed the coal tipple at the Alliquipa plant of the Jones & Laughlin Steel Co., causing a loss of about $8000.

Johnstown, Penn.—The Cramer Coal, Coke & Stone Co. has begun shipments from a 3000-acre tract which it is developing near here.

Brush, Colo.—While drilling a well on the ranch of Lew Forrest northwest of this town today, a 3-ft. vein of lignite coal was struck at a depth of 6 ft.

New Castle, Penn.—It is possible that the mines formerly operated by the Beaver Coal & Coke Co. will be reopened if present plans of the Board of Trade are carried out.

Frostburg, Penn.—John and William Merbach have discovered a rich vein of coal between Frostburg and Meyersdale. They will begin shipping coal just as soon as tracks can be put in.

Macdonaldton, Penn.—The Roberts & Schaefer Co. has closed a contract with the Brothers Valley Coal Co. for a steel tipple and Marcus conveyor to be installed at Macdonaldton. The contract price for this equipment is in the vicinity of $16,000.

Sharon, Penn.—The production record of the Carnegie Steel Co.'s coking plant was broken in 1913 by approximately 25,000 tons of furnace coke, although only one of the four batteries of ovens was in operation during December. The total output for the year was about 445,000 tons.

Henderson, Ky.—The People's Mining Co., recently acquired 65 acres of coal property from W. T. Lambert, the high price of $46 an acre being paid, this being an unusual figure for that section. A tract of 54 acres was purchased by the same company from J. W. Tood at $25 an acre.

Columbus, Ohio—The annual meeting of the Ohio District of the United Mine Workers was held in Columbus, Jan. 13. Delegates were present from all the mining districts of the state. One of the principal matters considered was the recommendation that the Ohio Mine Commission eliminate screens.

Seattle, Wash.—The 840 union coal miners of the Pacific company's mine at Black Diamond have returned to work, the conditions at which the men complained having been adjusted. After two men had been killed in the mine recently in an explosion, the miners refused to work longer until safer conditions prevailed.

Washington, D. C.—Complaints to Attorney General McReynolds from several Eastern cities that the price of hard coal is soaring, charge that the Pennsylvania state tax on every ton of anthracite mined within its borders is responsible. The attorney general has replied to complainants that some individual will probably bring suit to test the law, and if the department finds it advisable, it may intervene.

Fort Smith, Ark.—There is a prospect of the sale of several thousand acres of coal lands in Logan, Johnson and Yell counties to persons said to have the assistance of English and Dutch capitalists. It is officially announced that negotiations are on for the transfer of land and that an option has been secured. The tract is said to consist of 15,000 acres, most of it in Logan County, east of Scranton.

Washington, D. C.—There is absolutely no reason, according to S. C. Elliott, general counsel for the White Pass & Yukon R.R., why the Alaska Railway Bill, which is soon to come up for consideration in committee after Congress convenes should become a law. According to Mr. Elliott, the proposed legislation would involve the expenditure of $35,000,000 without any certainty of returns, and he asserts the belief that President Wilson is favoring the bill through a mistaken idea.

Pittston, Penn.—The Pennsylvania Coal Co. has received a severe set back in the Schooley Colliery operations, which for several years back have been going on. Recently two powerful electric pumps were installed and the work of lowering the water in the shaft had been progressing very encouragingly, but on Jan. 5 an unlooked for rush of water from some unknown source came upon the workmen so suddenly that the pumps and all apparatus were covered over before they could be withdrawn. The machinery which was but recently purchased at a great expense was covered over with mud and other debris, and it will be necessary to completely clean it before it can again be put to pump the water out of this mine.

Nordegg, Alberta—Development of the extensive property of the Brazeau Collieries, Ltd., near the new townsite of Nordegg, 120 miles west of Blackfalds, Alberta, is proceeding rapidly, and the first shipment will be made in January. The mine is situated on the new Canadian Northern Ry. branch from Stettler, the steel on which is now being laid as quickly as possible. Development has been proceeding for the last 18 months, during which 1400 ft. of tunnels have been driven through two seams 14 and 7 ft. thick respectively.

The coal is of a high grade suitable for locomotives. There are 35,000 tons now ready for shipment, which is under contract to the Canadian Northern. An uptodate plant with a capacity of 2000 tons per day has been contracted for to be installed in running order by Sept. 1, 1914, and in the meantime a temporary chute capable of handling 400 to 500 tons per day has been installed. When fully developed the mines will employ 450 men.

Coal Trade Reviews

General Review

Heavy storms and low temperatures cause a better tone, although situation is still dull. Anthracite output in excess of demand. Bituminous operations much curtailed. Some demurrage coal forced on the market but prices generally well maintained.

Generally severe weather in nearly all parts of the country during the first of the week, started an active movement in the retail hard-coal trade. The change has not been of sufficient duration to affect wholesalers as yet, but there is a better tone generally in all departments. However, producers are still compelled to make concessions in order to move tonnage, while dealers are already beginning to anticipate the possibility of carrying some winter-priced coal over after the Apr 1 discount goes into effect. The production continues in excess of demand, and the situation is particularly unfavorable at tidewater.

The recent cold weather has failed to help the bituminous market, and there is a feeling gradually developing among producers that a general slump can only be prevented by a strict curtailment. Even now mines are working under a heavily restricted output, while consumers are endeavoring to cancel old orders. Little spot business of any kind is being negotiated and off qualities are particularly dull.

Although a decided improvement on domestic business is expected in the Pittsburgh district as a result of the sharp fall in temperature, the demand at the moment is light; a resumption in general manufacturing effective the first of the year will help the situation some, but the absence of sustained cold weather has had a depressing effect. Conditions in Ohio show some improvement as a result of the more seasonable weather and an increase in manufacturing. Anticipation of labor troubles Apr. 1 is also having an effect upon the situation; with the market in its present unsatisfactory condition, operators will be ready to suspend operations indefinitely, if necessary, and the position of the miners is materially weakened.

While shipments from the Hampton Roads piers have fallen off during the week, the effects of the curtailed production over the holiday period are now being felt and accumulations are only about normal. Prices are holding remarkably firm in spite of a general slowing up. The Southern markets are contending with adverse weather conditions and dealers are showing little disposition to buy; an improving tendency is noticeable, but not much change is anticipated before spring.

The anticipated labor troubles next April have had a stimulating effect upon the Middle Western situation, which was also helped out by the colder weather. Large industrial concerns are showing an inclination to increase their stock piles, and the better grades are now commanding good figures. There has been an unexpected shortage of hopper bottom cars. Some demurrage coal is occasionally forced on the market for anything it will bring.

EASTERN MARKET

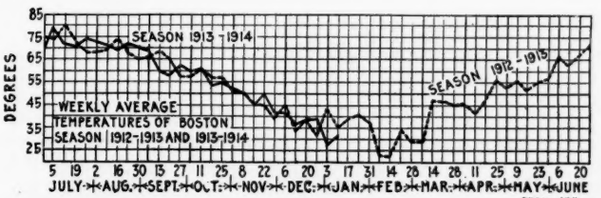
BOSTON, MASS.

More inquiry for bituminous. The Hampton Roads coals generally dull, but buyers begin to show interest in better grade Pennsylvanias. Anthracite demand also slightly improved, although it is still a weather market.

Bituminous—There is little change in the situation of Pocahontas and New River. When buyers are not seeking to postpone shipments on purchases made several weeks or months ago, they are indifferent, and no improvement is looked for in the immediate future. The off-shore demand is fairly steady, due to rather higher prices on the Welsh coals, and that is the only feature that gives any stability to present prices. The Western demand has fallen off materially and apparently a rigid curtailment is all that will prevent a generally softening market.

Georges Creek maintains its usual firm position. For spot shipment there is only a light inquiry and what tonnage is being moved is almost solely on season contract.

Within the week some buying interest has developed in the Pennsylvania grades, especially those that are more favorably regarded. Prices on these coals are more sensitive to the dull market we are experiencing than is the case with the Southern coals, and the few large buyers who have been waiting developments have now come in for hand-to-mouth deliveries. It is not especially significant but the market is so quiet in every direction that any move, however small, is bound to be noticed. The colder weather has improved the outlook but the fact that there is any reliance on its continuance shows how desperately slow the market is on all grades of bituminous.



Anthracite—The retail demand is wholly dependent on the weather. Just now some scattering business is being had and if the balance of the month is moderately cold there is sure to be a better call for anthracite in New England. The dealers are figuring closely so as not to carry winter-priced coal over into April and so confident are they that the companies can now supply cargoes on short notice that they are reluctant to file requisitions until the need for the coal is plainly evident.

Certain of the New York barge companies that advanced water freights 25c. in November to Boston have once more receded and practically all the anthracite shippers are now on a parity, so far as concerns along-side prices on the domestic sizes.

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$1.00@1.50	$1.25@1.60	$1.67@1.77	
Philadelphia*	2.25@2.75	2.50@2.85	2.92@3.02	
New York*	2.55@3.05	2.80@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.80@2.90
Boston†				3.72@3.82
Providence†				3.72@3.82

*F.o.b. †On cars.

NEW YORK

Holiday suspension has resulted in a shortage of some grades of anthracite. Main weakness in the tidewater market. Strike of the bargemen concluded. Soft coal easy and outlook unsatisfactory.

Bituminous—The recent bargemen's strike in New York Harbor came to an abrupt end when two or three of the largest individual towing concerns granted the increase demanded, five days after the strike started. It is said that this was conceded more for the purpose of squeezing out some of the smaller concerns who cut rates in time of slack business.

The market is still easy. The demand is light, and while there are no direct reports of demurrage coal, rumors of occasional lots being offered at $2.40@2.55 would seem to indicate that the market is being forced. Concerns that failed to contract during the active trade last summer have had a rather severe lesson in marketing coal; such operations are all generally closed down now. The car and labor supply are both fully up to requirements, but incipient labor troubles are still an aggravating condition in the mining regions. The anticipated suspension in mining Apr. 1, pending the arrangement of a new wage scale in the central competitive district, will, no doubt, cause some flurry through March, but conditions point to a quiet market through April and May if not longer. If an agreement is not reached on the wage-scale problem, there will be no business to negotiate, while if no suspension occurs, consumers generally will be so heavily stocked that they will not be in the market for some time to come. We quote the New York market off on some grades as follows:

West Virginia steam, $2.60@2.75; fair grades of Pennsylvania, $2.60@2.65 good grades of Pennsylvania, $2.75@2.85; best Miller Pennsylvania, $3.10@3.20; George's Creek, $3.15@3.25.

Anthracite—A sharp fall in temperature, accompanied by a heavy wind, approximating a gale, has started an abrupt rush for coal in retail circles. The early part of the week saw the coldest weather experienced in New York in 14 years. The changed conditions have not been of sufficient duration to affect the wholesale business yet; it is variously estimated that from one to three weeks of more or less continuous low temperatures will be required to effect any material difference in conditions. Unless there is considerable cold weather between now and Apr. 1, the companies may carry some winter stocks over into the summer business.

Full-time work at the mines is not yet general, although from weather indications the first of the week, production will soon be rapidly increased. Rice coal at the upper ports is in short supply as is also No. 1 buckwheat. The suspension in December has resulted in a shortage of egg, and there is not much pea at tide; chestnut is generally strong. The bituminous strike talk Apr. 1 may create some activity in the steam grades through February and March. Generally speaking, the main weakness in the market has been on tidewater business, the all-rail situation, as a rule, being comparatively strong.

We quote the New York hard-coal market on the following basis, the figures given not including the Pennsylvania state tax of 10c. on the domestic grades and 5c. on pea coal, as follows:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	$5.00	$4.50@5.00	$5.05	$4.45@4.95
Egg	5.25	5.15@5.25	5.30	5.10@5.20
Stove	5.25	5.25	5.30	5.15@5.20
Chestnut	5.50	5.50	5.55	5.35@5.45
Pea	3.50	3.50	3.50	3.45
Buckwheat	2.75	2.75	2.70@3.45	2.25@2.70
Rice	2.25	2.25@2.35	1.95@2.20	1.75@2.20
Barley	1.75	1.60@1.75	1.70	1.45@1.70

PHILADELPHIA

Hard-coal trade shows signs of improvement with the appearance of more seasonable weather. Increase in orders slight, however, and supply remains greater than demand.

Under the influence of more seasonable weather the local anthracite trade improved last week, but it has by no means reached a satisfactory state for the operator and dealer. The increase in orders was light, and the supply is still in advance of the demand.

With plenty of coal at hand the producers in many cases have been forced to make concessions in order to sell their product, but despite that fact less coal was sacrificed last week than in the closing week of 1913. There is little expectation of marked improvement in the trade until weather conditions are such as to bring about a greater consumption. Meanwhile dealers here are merely marking time.

The bituminous coal trade showed a slight improvement last week. Small advances in prices occurred in several grades, but there was little significance to these changes as the meager increase merely indicates getting back into the regular routine after the holidays.

BALTIMORE, MD.

Colder weather has helped the anthracite trade. Bituminous continues flat, with prices showing little or no change. Situation at the piers is not encouraging.

Real cold weather has proved quite a boon to the hard-coal trade here. During the past week the local dealers, especially those handling the smaller trade orders, have been busier than for any priod since winter set in. Continued warm weather had induced many to get along with scant supplies, and the change to fairly heavy orders is quite a welcome. Steaming sizes were reported easy the past week, the only scarcity with some dealers being in the smaller prepared grades, for which there was quite a rush in spots. Movement from the mines was easy, however, and no trouble in supply generally is anticipated unless blizzard-like conditions develop.

Interest continues deep here as to the effort to consolidate 20 of the largest retail concerns of the city. Some of these are said to be holding out for more money than is offered by those behind the merger, and the entire proposition looks uncertain for the time being.

Colder weather has so far failed to strengthen the soft-coal trade. Demand continues light for Maryland, West Virginia and western Pennsylvania products as a whole. In West Virginia the soft coals are bringing anywhere from 80@90c., while low-grade Pennsylvania steam coals are selling around 90@95c., and best grades at $1.25.

Coastwise movement continues fair on December chartering, but a lack of chartering has recently developed for late January and February loadings. This includes coastwise as well as foreign trade.

CENTRAL STATES

PITTSBURGH, PENN.

Coal demand poor, but slightly improved; circular prices being shaded, except with slack, which readily commands premiums; mine operations at about 50%. Coke market dull but firm.

Bituminous—On the whole, demand for coal is very light, but it has improved somewhat in the past few days. Many mills were closed over the holidays, and their resumption effects an increase in contract shipments, although resumption is only partial since the mills are operating at only about 60% of capacity. Domestic demand has experienced a slight increase, and a greater increase is to be expected before the week is out as a cold snap has just arrived. Mine operations generally are estimated at 50% of full capacity, the reduction being effected chiefly by operating on alternate days, few mines being closed altogether as it is deemed important to hold organizations together. Prices are rather irregular for mine-run and screened coal, circular figures being frequently cut, while slack is scarce and invariably commands a premium. Operators have themselves bought at $1, while sales to consumers are frequently at $1.10@1.15. Circular prices are: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in. steam, $1.50; 1¼-in. domestic, $1.55, per ton at mine, Pittsburgh district.

Connellsville Coke—The market has become quiet. Only two large interests among the operating furnaces failed to contract, and they are quite unwilling to pay prices asked. The $2 operators are reported firmer than ever on this figure, while most of the cheaper coke has already been disposed of. Prompt is in light demand. The next activity will be when the time arrives for arranging February tonnages, since several of the recent buyers covered for January only. We quote: Prompt furnace, $1.90; contract furnace, $1.90@2; prompt foundry, $2.40@2.65; contract foundry, $2.40@2.65, per ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Jan. 3 at 252,151 tons, an increase of 16,000 tons, and shipments at 250,787 tons, an increase of 17,206 tons. The small tonnage the previous week had been due to the holidays.

BUFFALO, N. Y.

Production heavily curtailed and market fails to show any improvement. Consumers refuse to see any serious possibilities in the impending wage-scale agreement. Prices generally weak.

Bituminous—The situation is not materially changed. The weather has been somewhat more wintry, but a thaw has again intervened, and no further stocking up is being done even where more room is available. Mines are running as slow as possible. As a rule, all consumers have more coal than they wish to carry and they are quite uneffected by stories of spring strikes.

Meanwhile the operators and miners are beginning to hold meetings, by way of getting into line for the new wage scale. If the miners insist on the concessions that they are now making up it will take a good part of the summer to arrive at any sort of agreement. Operators are at present quite indifferent to a lengthy shut-down and if the situation does not improve before April they will welcome suspension lasting until the market is clarified and it is possible to sell coal again at a profit. Had the trade remained strong, as it was expected to early last fall, the producers would have been quite at the mercy of the miners.

There are few sellers still claiming that they are getting old prices, although the nominal market is still quotable: $2.80 for Pittsburgh lump, $2.70 for three-quarter, $2.55 for mine-run and $2.25 for slack, with slack doing better of late than sizes. Allegheny Valley prices are about 25c. lower than Pittsburgh.

Coke—There is no improvement in the coke trade and dealers find it difficult to get former figures, based on $4.60 for 72-hr. Connellsville foundry. The light demand would make it appear that the actual consumption of pig iron was decidedly small.

Anthracite—Occasionally a shipper reports that the demand for anthracite has improved but the larger handlers agree that the late showing of winter has had little effect. Based on the consumption so far, there are a good many members of the trade who are ready to declare that they have coal enough to last them till April.

Shippers says that a severe cold snap will change the situ-

ation. Reports come in of heavy overstocks at upper-Lake ports, but indications are that these are all more or less overdone. A severe last half of winter would use the surplus up. Not much Lake tonnage is now being loaded here, as it is hard to get and shippers are not anxious.

COLUMBUS, OHIO

More seasonable weather has caused a better feeling in the trade. The movement is larger and some strength is shown in the price list. Unsettled condition because of the wage scale which expires Apr. 1.

The coal trade has regained some of its lost strength due to more seasonable weather and a disposition on the part of some to stock up to guard against a suspension after Apr. 1. The movement of all sizes is larger than the previous week and a better feeling is shown in all mining districts of the state. Coal men generally look for a gradual improvement from this time on.

One of the best features of the market is the better demand for steam grades. This is due to the resumption of many factories which were closed down during the holiday period. Then again some of the larger steam users have started to stock up in fear of a prolonged suspension after the expiration of the present wage scale. Railroads are also increasing their fuel requisitions and the net result is a better tone in that department of the trade.

In domestic circles things are still slow. Dealers stocks are large and they are not disposed to order at this time. It will require considerable cold weather to bring them into the market again. Most of the large householders have laid in their winter's supply of coal and the retailers have to depend upon small orders. Prices are holding at the level which has prevailed for the past two weeks. Some cutting is being done by the smaller producers and jobbers but the larger companies are busy maintaining the list. There is some demurrage coal on the market which tends to reduce prices.

The output in Ohio is gradually increasing although it is still far below the normal figures. In the Hocking Valley district the production is estimated at 50 per cent. of the average and the same is reported from Pomeroy Bend and eastern Ohio. In the strictly domestic fields the output is probably 40 per cent. of the average.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump.....	$1.75 @ 1.70	.....	$1.90 @ 1.80	$1.70 @ 1.60
3-4 inch.....	1.50 @ 1.45	$1:20 @ 1.15	1.60 @ 1.40	1.50 @ 1.45
Nut.....	1.30 @ 1.25	.....	1.50 @ 1.40	1.30 @ 1.25
Mine-run.....	1.30 @ 1.25	1.10 @ 1.05	1.30 @ 1.25	1.30 @ 1.25
Nut, pea and slack..	0.80 @ 0.75	.....	0.90 @ 0.85	0.80 @ 0.75
Coarse slack.....	0.70 @ 0.65	0.95 @ 0.90	0.80 @ 0.75	0.70 @ 0.65

DETROIT

Production restricted and prices heavy. Supplies large and customary winter business has failed to appear. Possibility of a suspension in April creating some interest.

Bituminous—Production in the various mining regions during the past week has been about 50 per cent. capacity. This was due, of course, to a lack of demand, which latter has also resulted in a sagging market, in spite of the efforts of the companies to maintain circular quotations. Even occasional concessions in prices has failed to stimulate business.

Car and labor supply have ceased to be factors in the situation. Local industrial concerns are working under restricted operations, and as a result the steam demand is light. The domestic business is lacking in the customary winter volume, and supplies on hand are generally large, while the demand is small, fluctuating according to temperatures. The possibility of a suspension in mining Apr. 1, when the present wage-scale expires, is the only uncertain feature in the market.

The local prices are quotable on the following basis:

	W. Va. Splint	Gas	Hocking	Cambridge	No. 8 Ohio	Pocahontas	Jackson Hill
Domestic lump.	$1.65	....	$1.50	....	....	$2.50	$2.50
Egg.....	1.65	....	1.50	....	....	2.50	2.50
Nut.....	1.20	....	1.10	....	....	....	....
Steam lump....	1.10	....	1.10	....	....	....	....
2-in. lump.....	1.00	$1.05	1.05	$1.00	$1.00	....	....
Mine-run.....	0.90	0.95	1.00	1.00	1.00	1.35	....
Slack.....	0.80	0.80	0.80	0.80	0.80	....	....

Anthracite—The market is dull with practically no business being negotiated and with scarcely any coal coming in.

Coke—Coke remains heavy, although it still seems to be doing better than any other line. Connelsville sells at $2; Semet Solvay, $2.85, and gas house, $2.75.

LOUISVILLE, KY.

Operators forcing the market in order to keep mines running. Consignment shipments frequently made. Market glutted and prices suffering acutely under adverse conditions.

Unseasonably mild weather for this season, in spite of indications that there would be some real winter, has kept the demand for fuel, down to the lowest possible mark; it can almost be said that the local market is demoralized. The necessity of disposing of the coal produced has forced operators and wholesalers to extreme measures, as an alternative to a complete shutdown. Shipments on consignment, without orders, are becoming common, and traveling representatives of the producers are doing everything in their power to dispose of domestic coal at almost any price. While there is undoubtedly some consumption of the domestic grades, there is still not sufficient being used to make much of an impression upon the stocks which have accumulated. In consequence, the market has been practically glutted, and it seems that only a protracted period of much colder weather than has yet prevailed will help things to any appreciable extent.

The steam market, while in much better shape than the domestic, shows what might be called a sympathetic weakness. In spite of the fact that the production of screenings has been curtailed, prices have undergone a pronounced slump. Western Kentucky nut and slack, usually in fair demand at 65c. was quoted last week down 15c., although this, of course, could not be called the market price. The best grades of Eastern Kentucky block can be had at the purchaser's own figures, $1.65 being eagerly accepted. For block and lump $1.50 is a good price. Western Kentucky domestic could be quoted 50c. lower all around, with light demand. Eastern Kentucky screenings, nut and slack, are in slow demand at 85 cents.

HAMPTON ROADS, VA.

Holiday season has reduced the demand and lower prices are frequently heard. Prices holding fairly well though some cutting.

While coal shipments from Hampton Roads during the week have been fair, they will hardly compare with the dumpings for the first week of December. The holiday season is no doubt responsible for most of the light demand during the past two weeks. However, the accumulation of coal is little above normal as shipments fell off considerably on account of the miners laying off several days during the holidays.

Coastwise shipments of the week have been to Jacksonville, Tampa, Charleston and the New England ports while foreign movement went to Kingston, Dakar, Media Luna, St. Thomas, Santiago, Port Castries, Naples, La Plata and Taltal.

While the demand for all grades has been light there has been little cutting in prices the majority of suppliers holding out for the circular. Some sales, however, have been reported at around $2.75 and lower. New River and Pocahontas run-of-mine has been practically the only coal moving from Hampton Roads during the week.

SOUTHERN AND MIDDLE-WESTERN

BIRMINGHAM, ALA.

Lump coal slightly improved. Steam grades easy and blacksmith normal. Furnace and foundry coke quiet. Some sales of pig iron for first-half delivery. Car situation fairly satisfactory.

There is really not much change in the market this week. Lump coal has enjoyed a slightly better trade, but with prices somewhat under the regular schedule. On account of the exceedingly mild winter so far, the dealers are in no hurry to accummulate large stocks. The retail yards report a better volume of business the last ten days than for some time, which is an encouraging sign. Steam coal is still quiet, though prices are remaining about stationary. Not much improvement can be looked for in this line until spring.

After the spurt on furnace coke, caused by heavy shipments West, made in order to accummulate stocks before the $2 increase in freight, coke has again assumed a normal condition, which is far from satisfactory to the manufacturers. Blacksmith coal is moving on about as usual. The car situation seems to be slightly improved for the time being.

NEW ORLEANS

Stocks on hand large, but supplies are being received in normal volume. Large orders to go forward from Pittsburgh on January rise. Use of anthracite increasing. Street railway company awards contract.

While stocks of coal in New Orleans are large, due to the

mild weather and some falling off in the bunker trade, there will be no decrease in the coal orders to come down the river with the January rise. From the Alabama fields tonnage is decreasing little if any and stocks are accumulating rapidly. One of the features of the local trade is the increased use of anthracite. Not many years ago scarcely a ton of such coal was used in this city but it is now quite general.

A contract for 175 tons of bituminous coal has been let by the street railway company to the Pratt Consolidated Coal Co. Representatives here of Alabama operators report that they are having great difficulty in disposing of their tonnage. Some curtailment is in progress and unless demand picks up quickly, it is likely to become more extensive.

INDIANAPOLIS

The approach of the expiration of the wage contract in the central competitive fields has brought out increased orders. Prices are firmer. Shortage of hopper-bottom cars.

January is producing some weather that is up to the general standard for the month, which has been good for the coal industry, both mining and distributing. The mining end has also been benefited by the approach of the time for making a new wage contract between operators and miners. The negotiations in the past have sometimes been prolonged until after Apr. 1, when the new contract should begin. It has thus become customary for consumers of coal to stock up as this date approached, in order to tide their needs over this idle period. An effort is being made to continue work at the mines this year in case of a delayed agreement, but consumers do not appear to be willing to take any risks. Already there is an increase in orders from the largest industrial consumers and the railroads will soon be increasing their piles.

Whether the larger business that some of the operators report is responsible for an unusual shortage in hopper cars is not known. These are generally plentiful and the gondolas scarce, but the position is now reversed. Most of the large consumers have facilities for handling the hoppers, and a better demand for coal from them would leave fewer available.

There has been no change in mine prices, but they are held more firmly. Retail quotations in this city are still on the basis set Sept. 20. Some of the largest dealers say that a cold spell this month or next will probably make mine prices higher, especially under an expected larger demand, due to wage contracts expiring, and that any advances at the mines will be promptly followed by retailers. Others intimate that any increase would be arbitrary, as stocks are large and there is yet much undelivered coal bought at old prices.

CHICAGO

Indications of a revival, but present conditions are far from satisfactory. Little business is being transacted by anthracite dealers, some of them having shut off shipments entirely. There is small demand for Hocking and the coke trade is light. Prices on several coals have been cut.

While there has been some improvement in local conditions the general situation still remains unsatisfactory. Inquiries received from retail dealers indicate a stronger disposition to buy, but it is conceded that any increase in production or shipment at present would cause a further slump in the market.

Dealers in anthracite coal report an unusually light volume of orders. All sales agents have curtailed shipments and some of them have shut off enirely until conditions improve. Receipts of all-rail coal are far in excess of sales and there is scarcely any movement of anthracite from the docks to interior points. In a number of instances quantities of this fuel have been forced upon retailers at exceptionally low prices to avoid demurrage charges.

There is scarcely any demand for Hocking, the circular price for which has been reduced from $2 to $1.75 by the larger producers. Some of this coal on track subject to demurrage is being disposed of at prices under circular. There has also been a reduction in the price of Franklin County coal. The major producers have named $1.75 as their circular figure and sales at prices ranging between $1.50 and $1.60 have been recorded. The coke market is dull. Scarcely any of this fuel is being absorbed by the domestic trade, about the only activity being in sales to Western smelter interests which have sought this market on account of labor difficulties in the West. Sales of furnace and foundry coke continue light.

Indiana mines are running chiefly on steam coal for the purpose of handling contracts entered into several months ago. Springfield operators are endeavoring to adhere to $1.50 for domestic coal, but sales at $1.25 are not uncommon. Producers of splint have reduced their price on 1¼-in. lump to $1.75 and Eastern Kentucky block coal is selling at from $1.75 to $2.25.

Prevailing prices at Chicago are:

	Springfield	Franklin Co.	Clinton	W.Va.
Domestic lump	$2.32	$2.55@2.80	$2.27	
Steam lump	1.97		1.97	
Egg		2.55@2.80		$4.30
Mine-run	1.87	2.30	1.87	3.45
Screenings	1.47	1.75@1.85	1.47@1.57	

Harrisburg quotations are: Domestic lump and egg, $2.55 @2.85; steam lump, $2.25; mine-run, $2.25; screenings, $1.75@ 1.85; No. 1 nut, $2.55@2.85; No. 2 nut, $2.55.

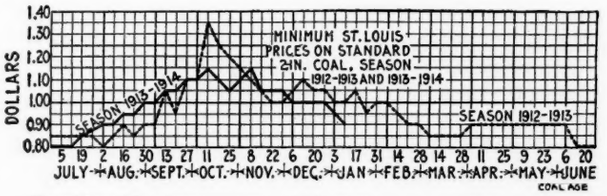
Prices asked for Carterville coal are: Lump, egg and No. 1 washed, $2.55@2.85; No. 2 washed, $2.55.

Coke—Connellsville, $5.25@5.50; Wise County, $5@5.25; byproduct, egg, stove and nut, $4.90@5; gas house, $4.65@ 4.75.

ST. LOUIS

Practically no change in St. Louis conditions, although the weather is slightly colder. Steam market holding up well. Smokeless and coke not moving and little demand for anthracite.

Market conditions the same as they have been or several weeks. The weather has been slightly colder, but nothing like real winter. Still, there is some domestic demand, just about enough to keep the steam market in a healthy condition. Even at that some of the operators are trying to force business and in many instances they cut prices 10 to 15c. a ton on lump and egg from the Carterville field.


DOLLARS
1.40
1.30
1.20
1.10
1.00
0.90
0.80
MINIMUM ST. LOUIS PRICES ON STANDARD 2-IN. COAL, SEASON 1912-1913 AND 1913-1914
SEASON 1913-1914
SEASON 1912-1913
5 19 2 16 30 13 27 11 25 8 22 6 20 3 17 31 14 28 14 28 11 25 9 23 6 20
JULY AUG. SEPT. OCT. NOV. DEC. JAN FEB. MAR APR. MAY JUNE
COAL AGE

Considerable demurrage coal going at anything it will bring, but the higher grade fuels still command a good figure. High-grade screenings are worth 80 to 85c. In the Standard district lump has sold as low as 90c. and screenings are hovering around 50 to 55c. The local car supply is more than ample and some mines have been idle for many weeks with strings of empties on their tracks.

There is little demand for anthracite and the coke and smokeless markets are glutted with consignment shipments.

The prevailing circular is:

	Carterville and Franklin Co.	Big Muddy	Mt. Olive	Standard
2-in. lump	.....	.....	.....	$0.90@1.00
3-in. lump	.....	.....	$1.40	.....
6-in. lump	$1.25 @ 1.50	$2.25	1.50	1.15@1.25
Lump and egg	1.85 @ 2.15	.....	.....	.....
No. 1 nut	1.15 @ 1.40	.....	.....	.....
Screenings	0.75 @ 0.80	.....	.....	.....
Mine-run	1.10 @ 1.20	.....	.....	.....
No. 1 washed nut	1.60 @ 1.75	2.25	1.60	.....
No. 2 washed nut	1.25 @ 1.35	.....	1.25	.....
No. 3 washed nut	1.15	.....	.....	.....
No. 4 washed nut	1.05	.....	.....	.....
No. 5 washed nut	0.50	.....	.....	.....

KANSAS CITY

Colder weather has stimulated business. Mine operations are being increased.

All available nut coal is being absorbed without difficulty in the Kansas City market, the only weakness being in the lump situation. The demand for nut seems to be largely responsible for the slow movement of lump.

However, the snappy weather is expected to stimulate all lines and the situation is in better shape than for several months. Dealers are ordering fairly well, and a continuation of present weather conditions will result in full-time mining operations in the near future. Most of the Kansas and Missouri mines are being worked to about two-thirds capacity, the prospects being for an extension of output, rather than the reverse. The market is showing more strength under better weather conditions, though no general advance in quotations has yet been made.

PORTLAND, ORE.

Eastern coal shippers look to Pacific Coast with view of handling cargoes through Panama Canal. Open winter for western Oregon and Washington does not tend to sharpen demand for fuel. Conditions practically unchanged.

The Portland Commercial Club has received inquiries from Atlantic Coast shippers asking for information as to the possibility of extending their markets to the Pacific Coast ports upon the completion and opening for traffic of the Panama Canal. It is believed here that with the opening of the canal and cheaper transportation rates the Pacific Coast states will prove an inviting field for the Eastern coal mines, although the production in the West and on the Pacific Coast is stead-

ily developing. The establishment of large coal bunkers to accommodate foreign shipping on the Columbia is also looked for in the near future on account of the increased shipping, as a result of the opening of the canal.

The weather this winter has been unusually mild and the demand for coal for domestic purposes has not been as heavy as in years past. However, the coldest weather here usually comes in January, February and March, and there is still a chance for the coal man. So far there has been no fluctuation in prices since the advance announced a couple of months ago.

PRODUCTION AND TRANSPORTATION STATISTICS

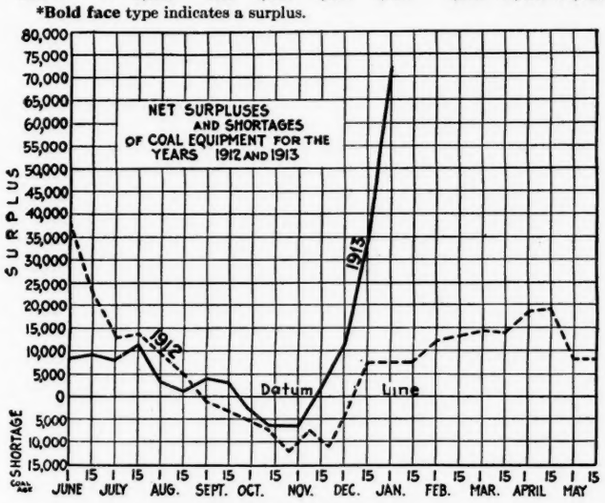
THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Jan. 1, as follows:

	Surplus	Shortage	Net*
New England Lines	571	0	**571**
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	16,311	0	**16,311**
Ohio; Indiana; Michigan; Western Pennsylvania	36,513	0	**36,513**
West Virginia, Virginia, North & South Carolina	1,811	29	**1,782**
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida	6,201	0	**6,201**
Iowa, Illinois, Wis., Minn.; North & South Dakota	4,151	2	**4,149**
Montana, Wyoming, Nebraska	300	0	**300**
Kansas, Colorado, Missouri, Arkansas, Oklahoma	2,563	1	**2,562**
Texas, Louisiana, New Mexico	423	22	**401**
Oregon, Idaho, California, Arizona	3,691	3	**3,688**
Canadian Lines	0	0	**0**
Total	72,535	57	**34,140**

	Sept. 1	Sept. 15	Oct. 1	Oct. 15	Nov. 1	Nov. 15	Dec. 1	Dec. 15
Surplus	8,689	8,714	7,953	6,014	6,720	10,520	17,621	**36,435**
Shortage	5,209	7,731	10,393	12,502	12,595	8,477	5,095	**2,295**
Net*	**3,480**	**983**	2,440	6,488	5,875	**2,043**	**12,526**	**34,140**

***Bold face** type indicates a surplus.



VIRGINIAN RAILWAY

The total shipments of coal over this road for November, 1913, were 421,971 tons as compared with 316,504 tons for the same month last year. For the first eleven months of 1913, the shipments were 4,190,394 tons as compared with 3,177,243 tons in 1912.

ANTHRACITE SHIPMENTS

Anthracite shipments for the calendar year 1913, were 69,069,628 tons as compared with 63,610,578 tons in 1912 and 69,954,299 tons in 1911. Production in 1912 was, of course, much curtailed due to the suspension in mining pending the arrangement of a new wage scale.

The feature of the anthracite movement in 1913 was the heavy shipments of the Lehigh Valley. For the first time in the history of the anthracite shipments, this road takes first place in the tonnage movement for the year, exceeding the Reading Co. by 100,000 tons. This is not indicative of a reduced capacity of the Reading mines, or a largely increased capacity of the Lehigh Valley. The Reading sales department was compelled to carry the new 2½% Pennsylvania State Tax throughout the bulk of the year, which materially narrowed the market for their product. Reading was also forced to restrict operations more during unfavorable market conditions, showing an inclination to conserve their supplies rather than attempt to force business.

The shipments for December 1912 and 13, and for the two years were as follows:

	December		12 Months	
	1913	1912	1913	1912
Phila. & Reading	1,058,723	1,223,880	12,914,887	12,852,386
Lehigh Valley	1,062,578	1,108,765	13,011,370	11,791,601
Cent. R.R. N.J.	663,395	760,479	9,092,433	8,342,477
Del. Lack. & West	839,384	850,977	9,903,541	9,065,622
Del. & Hudson	590,158	598,969	7,094,258	6,361,238
Pennsylvania	546,976	543,361	6,351,746	5,548,193
Erie	709,431	667,532	8,192,352	7,435,697
Ont. & Western	191,973	190,539	2,509,031	2,213,382
Total	5,662,618	5,944,502	69,069,628	63,610,578

COAL FREIGHT DECISIONS

I. C. C. No. 4604—Traffic Bureau (Nashville, Tenn.) vs. Louisville & Nashville R.R.

1—Conditions affecting the transportation of coal from Louisville & Nashville R.R. western Kentucky mines to Louisville, Ky., Memphis and Nashville, Tenn., not found to be so dissimilar as to preclude a comparison of the rates from the same fields to the three cities.

2—Rate of $1 per ton on coal to Nashville from Louisville & Nashville western Kentucky mines found to be unreasonable and rate of 80c. prescribed. A like rate from Nashville, Chattanooga & St. Louis Ry. mines in Tennessee and Alabama found to be unreasonable and rate of 90c. prescribed.

3—Complaint as to unreasonableness of $1 rate to Nashville on coal from Illinois Central western Kentucky mines not sustained.

4—The value of ton, car, and train mileage statistics in fixing rates discussed.

5—The Louisville & Nashville and the Nashville, Chattanooga & St. Louis interswitch all traffic, including coal, at Nashville. They refuse to switch coal to and from the Tennessee Central, which road retaliates by refusing to switch coal to or from the rails of either of the other two. Upon complaint;

Held, That the practice of all three roads is unreasonable, and further, that of the Louisville & Nashville and Nashville, Chattanooga & St. Louis is unjustly discriminatory. Discrimination required to be removed and reasonable practice prescribed.

6—"Terminals are either open or they are not" and a carrier may not exercise an arbitrary discretion, based upon a strained construction of the proviso of section 3, in saying for what roads and for what traffic it will open its terminals and for what other roads and traffic it will decline so to do.

I. C. C. Nos. 5650 5650, (Sub.—No. 1), 5650 (Sub.—No. 2) —Wisconsin Coal Co. (5650); Elmore Benjamin Coal Co. (5650 [Sub.—No. 1]); Callaway Fuel Co. (5650 [Sub.—No. 2]) vs. Pere Marquette R.R. Co. et al.

Complainants contend that they are entitled to free reconsignment of coal at Milwaukee and ask reparation on account of damage suffered as the result of alleged unjustifiable holding of cars at Ludington, including reconsignment and demurrage charges paid on cars detained, as well as tort damages. The complaint also embraces a charge of discrimination, and further alleges that the new tariff, effective Feb. 9, 1913, is unreasonable because of its failure to provide for reconsignment at Milwaukee: **Held:**

1. Complainants were not entitled to free reconsignment at Milwaukee under the tariff of Oct. 2, 1912, but were entitled to reconsignment at a charge of $2 per car. The detention of cars at Ludington was unjustifiable and demurrage charges were improperly assessed and must be refunded.

2. With respect to cars which arrived at Ludington before the receipt of passing notice and proper time for giving disposition orders, the charges paid were improperly assessed and should be refunded. There is no evidence upon which to measure damages as to cars on which the notice was sufficient. Damage regarding these lies in the difference between the value of the reconsignment service at Milwaukee and at Ludington. No damages were proved as the result of granting reconsignment to complainants' competitors and denial of the service to complainants.

3. The Commision's jurisdiction to award tort or general damages, as distinguished from rate damages, discussed in Jaynes v. P. R.R. Co., 17 I. C. C., 361, and in Hillsdale Coal & Coke Co. v. P. R.R. Co., 23 I. C., 186. In the present case there should be no award for damages of this nature. This conclusion rests on the general principle of the law of torts that one who suffers a tort damage must use due diligenec to minimize or avoid his loss.

4. The Commission has power, in its discretion, to require the establishment of reconsignment and diversion on the basis of the through rate from the point of origin to new destination, with a fair charge for the extra services performed.

5. A carrier may, as a matter of convenience, when its terminal tracks are congested, hold cars at some point short of destination, provided such a course involves no disadvantage to the public.

6. Tariff provision with regard to the giving of passing notice at Toledo should be made. If after the receipt of such notice shippers fail to give disposition orders before the cars reach Milwaukee, they shall be charged for the service $2 per car; otherwise the service is to be free.

7. The power of Congress to regulate interstate commerce is not hampered by contracts made by individuals, L. & N. R.R. Co., v. Mottley, 219 U. S., 467. A corporation cannot disable itself by contract from the performance of public duties and thereby make public accommodation or convenience subservient to its private interests. Gibbs **v.** Consolidated Gas Co., of Baltimore, 130 U. S., 398.

8. The question of detention is one that must be worked out by itself, and the advantages of reconsignment cannot be thrown away in order to avoid abuses that can be remedied in other ways.

FOREIGN MARKETS

GREAT BRITAIN

Jan. 2—Owing to holiday influences, inactive conditions are in evidence. Approximate quotations as follow:

Best Welsh steam	$4.80@4.92	Best Monmouthshires	$4.26@4.3
Best seconds	4.56@4.68	Seconds	4.02@4.14
Seconds	4.44@4.56	Best Cardiff smalls	2.64@2.78
Best dry coals	4.56@4.68	Seconds	2.52@2.64

The prices for Cardiff coal are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both net, exclusive of wharfage, and for cash in 30 days.

BELGIUM

Exports and imports into Belgium for the first nine months of 1912 and 1913 were as follows:

	Imports		Exports	
	1912	1913	1912	1913
Coal	6,689,148	5,954,292	3,713,154	3,741,741
Coke	851,911	691,920	813,345	738,589
Briquettes	355,394	329,684	470,363	482,579

AUSTRIA

During the first nine months of this year the production of coal in Austria totaled 12,234,247 tons, as against 11,656,476 tons in the corresponding period of 1912; the output of briquettes of coal was 151,179 tons, as against 120,855 tons; and the make of coke 1,909,235 tons, as against 1,716,143 tons. The lignite production during the same period was 20,710,900 tons, as against 19,490,252 tons; and the make of lignite briquettes was 175,502 tons, as against 175,256 tons.

FRANCE

Exports and imports into France for the first seven months of 1913 and 1912 were as follows:

	Imports		Exports	
	1912	1913	1912	1913
Coal	8,713,200	10,777,100	1,206,397	779,428
Coke	1,550,900	1,911,100	104,307	132,736
Briquettes	632,300	633,900	121,192	120,299

The "Daily Consular and Trade Reports" says regarding the situation in Southern France:

The production of coal in the departments of Gard, Bouches-du-Rhone, Basses-Alpes, and Hautes-Alpes amounted to 2,832,257 metric tons of 2204.6 pounds each in 1912, as compared with 2,723,915 metric tons in 1911. In view of the insufficiency and the poor quality of the native coal supply, large quantities are imported. During 1912 1,476,158 metric tons of coal, 21,036 metric tons of coke, and 62,030 metric tons of patent fuel were imported, while 702,237 metric tons of coal, 560 metric tons of coke, and 99,578 metric tons of patent fuel were exported. Of the imports, 17,423 metric tons of coal and 15,911 tons of coke came from the United States.

In this connection the following article, which appeared in the "Liverpool Journal of Commerce," of October 10, is of interest:

The freight rate from the United States to Marseille was about 17 shilling 6 pence ($4.26) last year. The freight rate paid last September was 13 shillings ($3.16). This sharp drop in freight rates is a point in the American coal exporter's favor, and as there seems a probability of freight rates dropping still further in the near future, it is anticipated that an increased business in America's foreign coal export trade will be shown.

No. 12,258. Coaling Plants and Sand Houses—The American consulate general at Ottawa, Canada, reports that the Commissioners of the Transcontinental Railway at Ottawa have advertised for tenders, to be received until January 7, for the construction of six 200-ton mechanical coaling plants with sand houses complete, to be erected at the following points on the line of the railway: Monk, Bridge, Fitzpatrick, Parent, Doucet and O'Brien, all in the Province of Quebec. Plans may be seen and forms of tender and specifications obtained at the office of the mechanical engineer at Ottawa.

COAL SECURITIES

The following table gives the range of various active coal securities and dividends announced during the week ending Jan. 10:

Stocks	Week's Range High	Low	Last	Year's Range High	Low
American Coal Products	84†	82†	84†	82	82
American Coal Products Pref.	..	..	105	....	....
Colorado Fuel & Iron	31	28⅝	30¼	31	28¼
Colorado Fuel & Iron Pref.	....	....	155	....	....
Consolidation Coal of Maryland	....	....	102½	....	....
Island Creek Coal Com	48	48	48	48½	48
Island Creek Coal Pref.	84½	84½	84½	85	83½
Pittsburgh Coal	19½	18	18½	19½	17⅞
Pittsburgh Coal Pref.	88½	86	86	88½	86
Pond Creek	19⅝	18⅜	19	19⅝	18⅜
Reading	170⅜	167⅞	169½	170⅜	166½
Reading 1st Pref.	87½	87½	87½	88	87½
Reading 2nd Pref.	91½	91	91	91½	91
Virginia Iron, Coal & Coke	40	40	40	40	40

Bonds	Closing Bid	Asked	Week's Range or Last Sale		Year's* Range	
Colo. F. & I. gen. s.f.g. 5s	90½	93	91½	91½	90	99½
Colo. F. & I. gen. 6s	102½	106½	107½	June '12	..	..
Col. Ind. 1st & coll. 5s. gu	78½	79	76½	79	75	85
Cons. Ind. Coal Me. 1st 5s	76	79	76	Aug. '13	76	76
Cons. Coal 1st and ref. 5s	..	92	87½	Dec. '13	87	87½
Gr. Riv. Coal & C. 1st g 6s	..	..	102½	April '06	..	..
K. & H. C. & C. 1st s f g 5s	93	..	92½	Dec. '13	91	98
Pocah. Con. Coll. 1st s f 5s	..	85½	86	Oct. '13	85	87½
St. L. Rky. Mt. & Pac. 1st 5s	75	77	77	Dec. '13	73	80½
Tenn. Coal gen. 5s	98	99½	99	99	96	103
Birm. Div. 1st consol. 6s	101	102½	101	101½	100⅜	103
Tenn. Div. 1st g 6s	101	101½	101	101	100½	102
Cah. C. M. Co. 1st g 6s	..	..	103	July '13	103	103
Utah Fuel 1st g 5s	..	..	..	....	..	..
Victor Fuel 1st s f 5s	..	84	80	May '13	79½	80
Va. I. Coal & Coke 1st g 5s	93	95	92½	93	92	98

*For the full year 1913. †Sale involving less than 100 shares.

DIVIDENDS

Burns Brothers—Regular quarterly dividend No. 2 on the common of 1¼%, payable Feb. 15 to holders of record Jan. 31, and regular quarterly No. 4 on the preferred of 1¾%, payable Feb. 2 to holders of record, Jan. 15.

New River Co.—Regarding the proposed sale of this company to a British Syndicate, it is stated that the property is optioned at $90 per share of preferred stock with accrued dividends of $30 per share and $5 per share of common. When this stock was issued, a decade ago, two shares of common were given as a bonus with each share of preferred, so that according to the terms of sale, stockholders still retaining all their original holdings will realize $130 per share on their stock.

St. Louis Rocky Mountain & Pacific Co.—This company is said to enjoy the distinction of having the largest coal tract under private ownership in the United States. The company has 13 mines in operation, and has a gross capacity of 10,000 tons daily. Dividends of 5% per annum are paid on the $1,000,000 outstanding preferred stock. The balance sheet to June 30, 1913, showed current assets to be practically double the liabilities.

Canadian Coal & Coke Co.—Fully three-fourths of the authorized issue of $1,000,000 notes of this company have been sold, and the $500,000 advance from American bankers who were handling this arrangement, has already been made. The money received will wipe out the present indebtedness of the company and provide about $350,000 for completion of new development work. It is expected that the present average capacity of 1500 tons a day will be increased to 4000 tons when this new work is completed.

Philadelphia & Reading Coal & Iron Co.—According to a statement of this company, filed with the Massachusetts secretary of state, its coal lands are being depreciated at the rate of $500,000 per annum. Thus the assets show the coal lands to be valued at $49,403,659 in 1912, and $48,905,221 in 1913. The total assets of the company in 1913 are placed at $88,301,880.